

K4  
11/2: C97  
1999  
C.2



N.C. DEPT. OF TRANSPORTATION  
CLEARANCE

MAY 27 1999

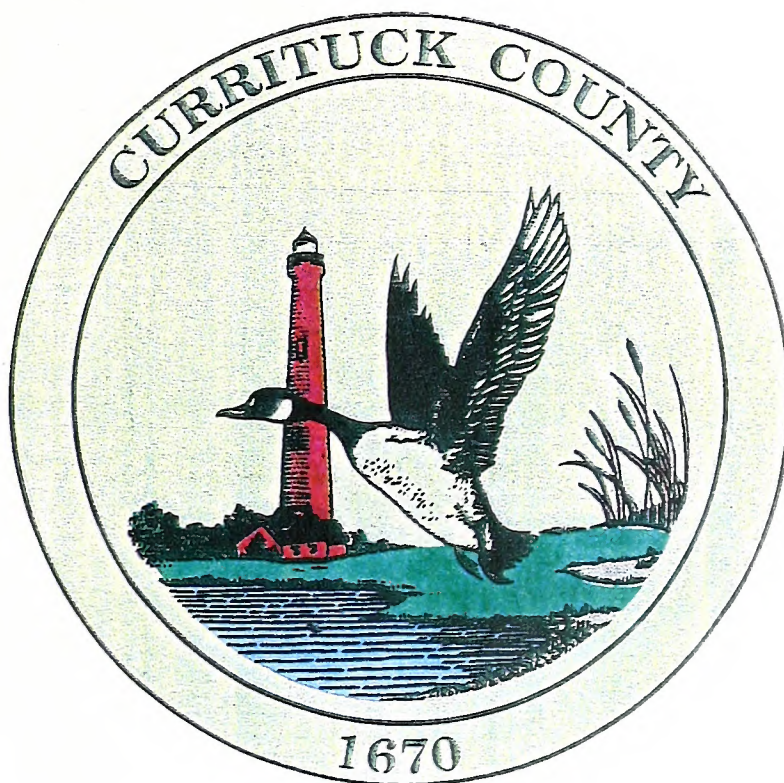
North Carolina Department of Transportation  
Statewide Planning Branch  
Systems Planning Unit

STATE LIBRARY OF NORTH CAROLINA  
RALEIGH


# **THOROUGHFARE PLAN TECHNICAL REPORT**

for

## **CURRITUCK COUNTY**



**March, 1999**



Digitized by the Internet Archive  
in 2011 with funding from  
State Library of North Carolina

# ***Thoroughfare Plan Technical Report for Currituck County, North Carolina***

## **Prepared by:**

Statewide Planning Branch  
North Carolina Department of Transportation

## **In cooperation with:**

Currituck County  
Federal Highway Administration  
US Department of Transportation

**March, 1999**

---

Mike Bruff, P.E.  
Statewide Planning Branch  
North Carolina Department of Transportation



# Acknowledgments

## **Persons responsible for this report:**

Senior Transportation Engineer:

J. T. McDonnell, P.E.

Systems Planning Unit Head:

M. S. Bruff, P.E.

Statewide Planning Branch Manager:

M. R. Poole, Ph.D., P.E.

Engineering Technician:

J. M. Jones

Special thanks to Mr. Jack Simoneau, AICP, Director of Planning and Inspections for Currituck County, for his foresight and drive in developing this plan. Also, thanks to the Currituck County Planning Board and Board of Commissioners for their assistance and commitment to long-range planning.



# Contents

<b>Executive Summary .....</b>	<b><i>i</i></b>
Overview .....	<i>i</i>
Thoroughfare Planning .....	<i>i</i>
Phase I Environmental Study .....	<i>i</i>
Highlights of the Thoroughfare Plan .....	<i>i</i>
Implementation .....	<i>ii</i>
 <b>Chapter 1: Introduction .....</b>	 <b>1</b>
 <b>Chapter 2: Thoroughfare Plan .....</b>	 <b>3</b>
Thoroughfare Plan Recommendations .....	3
Minor Arterials .....	3
Major Collectors .....	7
Minor Collectors .....	7
Connector Roads.....	9
NC Highway Trust Fund Projects .....	9
Construction Priorities and Cost Estimates .....	10
Bridge Replacement Priorities .....	13
 <b>Chapter 3: Implementation .....</b>	 <b>15</b>
State-County Adoption of the Plan .....	15
Corridor Preservation .....	15
Funding .....	16
 <b>Chapter 4: Trends and Related Issues .....</b>	 <b>19</b>
Population .....	19
Economy and Employment .....	20
Land Use .....	20
Vehicle Registration .....	22
Travel Demand .....	22
Transportation Improvement Program Projects .....	31
 <b>Chapter 5: Travel Deficiency Analysis .....</b>	 <b>33</b>
Capacity Deficiency Analysis .....	33
1995 Analysis .....	34
2025 Analysis .....	34
Traffic Accident intersections .....	34
Bridge Conditions .....	35
 <b>Chapter 6: Environmental Concerns .....</b>	 <b>41</b>
Environmental Screening .....	41

## Tables

1. Recommended Improvement Priorities and Cost Estimates .....	10
2. Recommended Bridge Improvement Priorities .....	13
3. County Population Growth .....	19
4. Township Population Growth .....	19
5. Housing Units in Currituck County .....	20
6. Commuting Patterns .....	21
7. Persons per Vehicle Trends .....	22
8. Road Capacities .....	24
9. Minimum Tolerable Lane Widths .....	31
10. Accident Locations .....	35
11. Functionally Obsolete Bridges .....	36
12. Structurally Deficient Bridges .....	36

## Figures

1. Currituck County Thoroughfare Plan .....	<i>iii</i>
2. TIP Projects and Recommended Improvements .....	5
3. Connector Roads.....	11
4. Average Daily Traffic Volumes .....	25
5. Traffic Volume Comparison, Piedmont vs. Coast .....	27
6. Average Summer Weekday Traffic Volumes .....	29
7. Deficient Bridges .....	37
8. Environmental Concerns .....	41

## Appendices

### Appendix A: Thoroughfare Plan Street Tabulation

Typical Cross Sections .....	A 1
Figure A-1: Typical Thoroughfare Cross Sections .....	A 5
Table A-1: Thoroughfare Plan Street Tabulation and Recommendations .....	A 7

### Appendix B: Thoroughfare Planning Principles

Benefits of Thoroughfare Planning .....	B 1
County Thoroughfare Planning Concepts .....	B 1
Rural Thoroughfare Classification System .....	B 1
Objectives of Thoroughfare Planning .....	B 3
Operational Efficiency .....	B 4
System Efficiency .....	B 5

Application of Thoroughfare Planning Principles .....	B 5
Figure B-1: Schematic Illustration of a Functionally Classified Rural Highway Network .....	B 3
Figure B-2: Functional Classification for Currituck County .....	B 5

## **Appendix C: Benefits Analysis**

Table C-1: Environmental Considerations .....	C 1
Table C-2: Impact Probability .....	C 2
Table C-3: Benefits Evaluation of Selected Thoroughfare Plan Projects ...	C 2

## **Appendix D: Recommended Subdivision Ordinances**

Definitions .....	D 1
Design Standards .....	D 3
Table D-1: Minimum Right-of-Way Requirements .....	D 4
Table D-2: Design Speeds .....	D 5
Table D-3: Sight Distance .....	D 6
Table D-4: Superelevation .....	D 6
Table D-5: Maximum Vertical Grade .....	D 7
Table D-6: Exact Metric Equivalents .....	D 9
Table D-7: Exact English Equivalents .....	D 9
Table D-8: NCDOT Metric Roadway Conversions .....	D 9

## **Appendix E: Level of Service Definitions**

Figure E-1: Levels of Service .....	E 3
-------------------------------------	-----

## **Appendix F: County and Public Involvement**

Citizen Survey .....	F 1
Public Involvement.....	F 1



# **Executive Summary**

## **Overview**

Officials of Currituck County, prompted by a desire to adequately plan for the future transportation needs of Currituck County, requested the North Carolina Department of Transportation's (NCDOT) assistance in updating the 1988 Currituck County Thoroughfare Plan. The primary concern of the Currituck County Board of Commissioners was the rapid development occurring in the region and how this growth might impact the existing transportation system.

## **Thoroughfare Planning**

The objective of thoroughfare planning is to enable the transportation network to be progressively developed to adequately meet the transportation needs of a community or region as land develops and traffic volumes increase. By planning now for our future transportation needs, unnecessary costs to the physical, social, and economic environment can be avoided or minimized. Thoroughfare planning is a tool that can be used by local officials to plan for future transportation needs, while at the same time reducing the costs to our environment.

The primary purpose of this report is to present the findings and recommendations of the thoroughfare plan study conducted for Currituck County. The secondary purpose of this report is to document the basic thoroughfare planning principles and procedures used in developing these recommendations. This report is divided into three parts. The first part of the report, Chapter 1, provides an introduction to the study. Chapters 2 and 3 provide a detailed description of the Thoroughfare Plan study recommendations and address different methods by which these recommendations can be implemented. Chapter 4 discusses traffic trends and other issues that affect transportation in the County. Finally, Chapters 5 and 6 cover the traffic analyses conducted and the environmental concerns considered in the development of the plan.

Further information that will be useful to area planners is provided in the Appendices. The complete Thoroughfare Plan Street Tabulation, including typical cross sections and detailed recommendations, is contained in Appendix A. The principles of thoroughfare planning are covered in Appendix B. The benefit/cost analysis of major projects is included in Appendix C. Recommended definitions and design standards for subdivision ordinances are listed in Appendix D. Appendix E contains definitions of the various levels of service discussed in the report. Finally, Appendix F provides an overview of the involvement of the County and the general public in the development of the plan.

## **Highlights of the Thoroughfare Plan**

Major highlights of the 1998 Currituck County Thoroughfare Plan are outlined below. The Thoroughfare Plan Map is shown in Figure 1. Project numbers for those projects

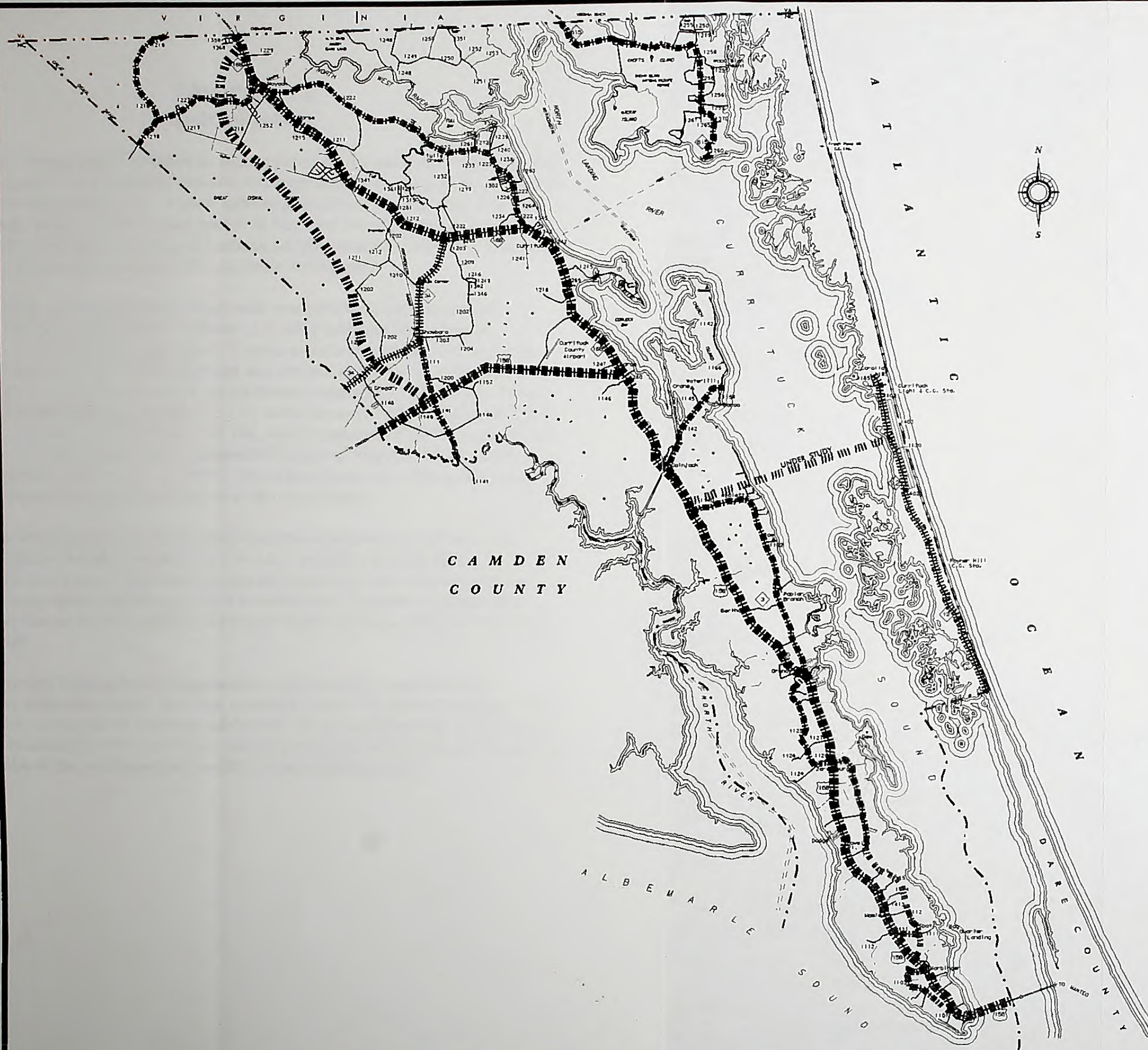
included in the 2000-2006 Transportation Improvement Program (TIP) are shown in parentheses.

1. **NC 168:** widen existing roadway to five lanes from US 158 to the Virginia State Line (TIP #R-2228)
2. **Mid-Currituck Bridge:** construct a new structure over the Currituck Sound between Coinjock and Corolla (TIP #R-2576)
3. **US 158:** widen existing roadway to a multi-lane facility from Camden County line to NC 168 (TIP #R-2574)
4. **US 158:** widen existing roadway from NC 168 to the proposed Mid-Currituck Bridge to seven lanes
5. **NC 168 Bypass:** construct a two-lane facility on new location from north of Moyock to US 158 approximately 2.4 km (1½ miles) east of North Indian Town Road (SR 1147)
6. **NC 12:** widen existing roadway to four lanes with a raised median from the proposed Mid-Currituck Bridge to Dare County
7. **Interchange at US 158 and NC 168:** Convert at-grade intersection to full interchange (TIP #R-4011)

## Implementation

The North Carolina Department of Transportation (NCDOT) and Currituck County are jointly responsible for the proposed thoroughfare improvements. Cooperation between the State and the County is of primary concern if the recommendations outlined above are to be successfully implemented. At the time of this report the plan has not been adopted by Currituck County. Once the plan is mutually adopted, it will be the responsibility of the County to implement the Plan following the guidelines set forth in Chapter 3 of this report.

It is important to note that the recommended plan is based on anticipated growth within the county as indicated by past trends and additional information supplied by the county planning staff. Prior to the construction of each project, a more detailed study will be required to revisit development trends and to determine the specific location and design requirements for each facility.



# LEGEND

	EXISTING	PROPOSED
INTERSTATE		
OTHER PRINCIPAL ARTERIAL		
MINOR ARTERIAL		
MAJOR COLLECTOR		
MINOR COLLECTOR		

## ADOPTED BY:

CURRITUCK COUNTY  
INFORMATION WORKSHOP  
PUBLIC HEARING

RECOMMENDED BY  
STATEWIDE PLANNING  
N.C. DEPARTMENT OF  
TRANSPORTATION

May 28, 1998

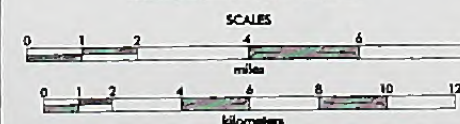
## FIGURE 1 RECOMMENDED THOROUGHFARE PLAN



## CURRITUCK COUNTY NORTH CAROLINA

PREPARED BY THE  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS - GIS UNIT

IN COOPERATION WITH THE  
U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION





# **Chapter 1**

## **Introduction**

A well planned transportation system is an asset to the economic and social well-being of a growing community. It provides the means to transport people and goods from one place to another quickly and conveniently. A good highway system must not only meet existing travel demands, but also be able to keep pace with the future development of the region. Thus, this report will identify existing and anticipated transportation problems in Currituck County and recommend a course of action for future development.

Currituck County is primarily rural in nature, with spot residential and commercial development throughout the county. However, it is being influenced by increased development in the Chesapeake Bay area of Virginia to the north and Dare County to the south. It is likely that residential development will continue to grow at an accelerated pace and Currituck County will continue to act as a bedroom community to these areas. Major highway facilities in the county include: US 158, which crosses North Carolina from east to west along the northern part of the state; NC 168, which connects Currituck County and the Outer Banks of North Carolina to the Chesapeake Bay area of Virginia; NC 34, which provides a short-cut between US 158 and NC 168 in the western part of the county; and NC 12, which provides access along the majority of the Outer Banks.

The recommended Currituck County Thoroughfare Plan was developed following the principles of county thoroughfare planning outlined in Appendix B of this report. Thoroughfares were located based upon existing and anticipated land use and population distribution, topographic conditions, and field investigations. The plan advocates those improvements that are felt to be essential for proper traffic circulation within the 1995-2025 planning period.

The North Carolina Department of Transportation will be primarily responsible for improvements within the County. However, Currituck County can greatly contribute to the implementation of this plan by enforcing subdivision and zoning regulations. It is desirable that the plan be adopted by both the County and the Department of Transportation to serve as an official guide in the development of an effective thoroughfare system.



## **Chapter 2**

### **Thoroughfare Plan**

A thoroughfare plan identifies existing and anticipated future deficiencies in the transportation system and uncovers the need for new facilities. The thoroughfare plan also provides a representation of the existing highway system by functional use, which includes the arterial street system, the collector street system, and the local street system. A full description of these various systems and their subsystems is provided in Appendix B.

This chapter presents the thoroughfare plan recommendations. It is the goal of this study to recommend a plan for the transportation system that will serve the anticipated traffic and land development needs of Currituck County over the next 30 years. The primary objective of this plan is to reduce traffic congestion and improve safety by eliminating both existing and anticipated deficiencies in the thoroughfare system. These recommendations are shown in Figure 2.

### **Thoroughfare Plan Recommendations**

#### ***Minor Arterials***

**US 158** - The section of US 158 from Camden County to NC 168 is currently a 2-lane road which carries approximately 6,600 vehicles per summer weekday. This traffic volume is projected to increase to 21,400 vehicles per summer weekday in the design year (2025). The current Transportation Improvement Program (TIP) has identified the widening of this corridor to a multi-lane facility as a future need (TIP Project R-2574). This improvement will provide a much needed east-west multi-lane facility for the increasing number of commuters, as well as visitors to the Outer Banks traveling along this route. It is recommended this widening consist of a four-lane divided facility with grassed median. This cross section helps to minimize turning movements across the roadway and preserve the capacity of the facility.

The southern section of US 158 between NC 168 and the Dare County line is currently a five-lane roadway which carries up to 17,100 vehicles per summer weekday. This traffic volume is projected to increase to between 48,300 and 55,500 vehicles per day on a typical summer weekday by the year 2025. With the addition of the Mid-Currituck Bridge (TIP Project R-2576), it is estimated that 17,000 vehicles per summer day will be diverted from the southern-most section of US 158. However, traffic will still reach volumes that exceed the capacity of the existing five-lane road.

To accommodate the projected increase in traffic on this section of US 158, it is recommended that it be widened to a six-lane divided facility with a median. This design will help to minimize accidents on this extremely busy summertime-tourist road by relocating left-turning movements to specific intersections. This type of facility also has a higher capacity than a 7-lane undivided road, which will be especially needed between the intersection of US 158/NC 168 and the proposed Mid-Currituck Bridge.

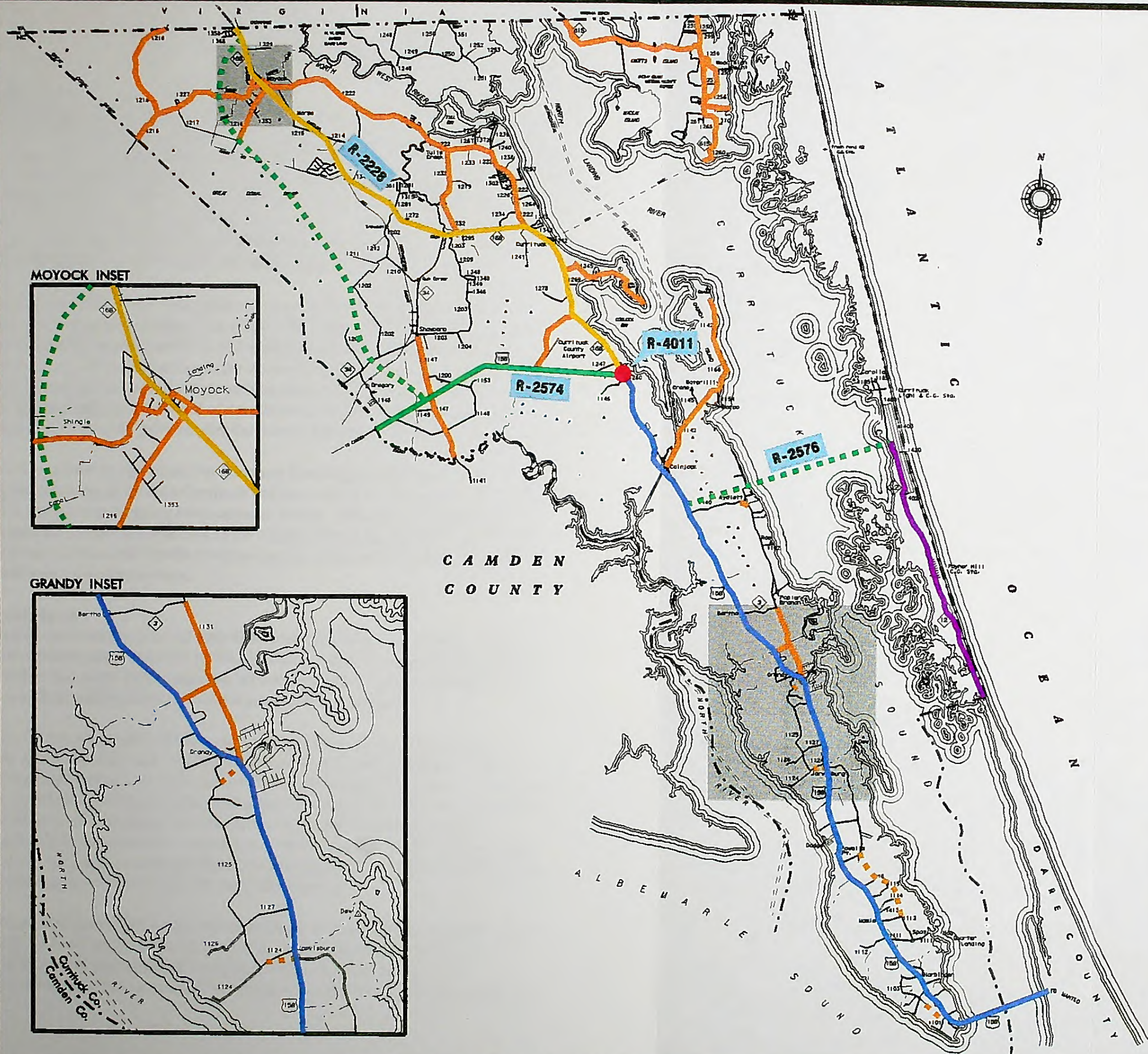
Also, due to the extremely high projected turning movements on US 158 at its intersections with NC 168 and the proposed Mid-Currituck Bridge, an investigation into the possibility of constructing fly-overs at these locations was requested by the County. This study was conducted by the Traffic Engineering Branch of NCDOT. The study stated that a fly-over concept would definitely be needed at the US 158/NC 168 intersection in combination with the proposed four-lane and six-lane road improvements. At the intersection of US 158 with the proposed Mid-Currituck Bridge, an at-grade intersection with multiple turning lanes yielded a Level-of-Service C, which is acceptable; however, the study also stated that "...from a service, operations, and capacity perspective, the grade-separation concept would be the preferred option." Thus, fly-overs are recommended at both intersections.

**NC 168** - This roadway provides a major north-south connection from Virginia to the central part of Currituck County. NC 168 is used heavily by vacationing Virginians as a route to the North Carolina Outer Banks. Traffic counts for this two-lane facility show average daily volumes between 8,600 and 10,800 vehicles, which is approaching capacity. NC 168 is currently being widened to a 5-lane curb and gutter and shoulder section. However, even with the widening, traffic projections for the year 2025 indicate that this facility will again reach capacity.

Average summer weekday traffic is expected to exceed 47,000 vehicles per day in the design year. In addition, the average speed along this route will decrease during the planning period due to the increased development and addition of traffic signals along the route. Because of the intense development, adding lanes to this road (i.e., widening from five to seven lanes) will be less than optimally effective in increasing capacity and decreasing travel times along this route. In addition, widening to seven lanes could potentially disrupt the businesses located along the route, as additional right-of-way will be needed.

Thus, to accommodate the increased traffic desiring to travel in this corridor, a bypass of NC 168 is proposed. A relatively clear corridor is currently available to the west of the existing facility, beginning just north of Moyock and continuing south to intersect with US 158 west of NC 168. A four-lane divided road with full control of access is recommended to preserve the traffic-carrying capacity of the route well into the future.

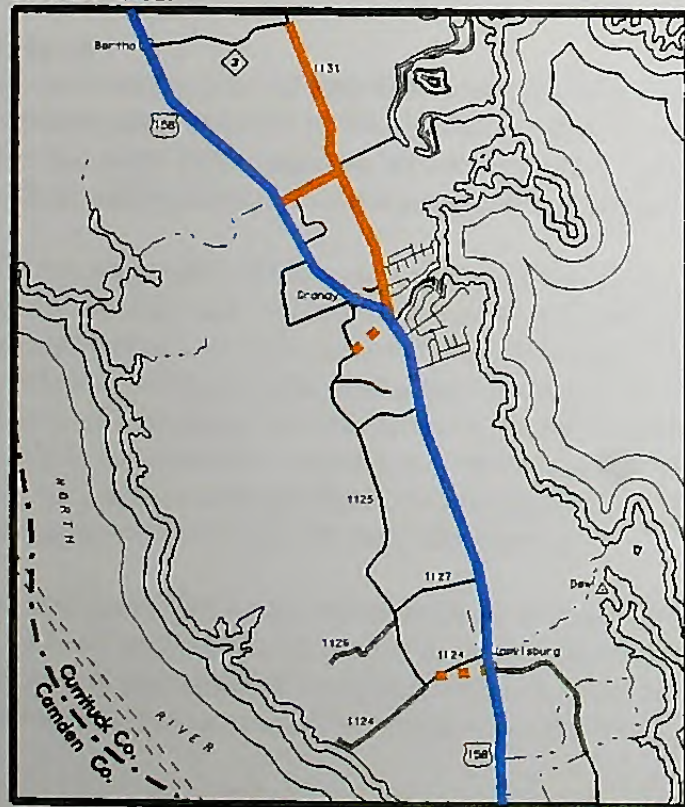
A preliminary environmental analysis has been completed on the recommended corridor. This will assist the county in preserving the future right-of-way for this new road. A defined corridor will make it easier for the county to protect right-of-way for the road project. It will also minimize the cost of the facility and potential disruption to the surrounding communities that are anticipated to be built between now and the time when the road is built.



MOYOCK INSET



GRANDY INSET



# LEGEND

	Existing Roadway	New Location
2 LANES		
4 LANES (WITH RAISED MEDIAN)		
4 LANES (DIVIDED)		
5 LANES		
6 LANES (DIVIDED)		
TIP PROJECT		
PROPOSED INTERCHANGE		

June 12, 1998

## FIGURE 2 TIP PROJECTS AND RECOMMENDED IMPROVEMENTS

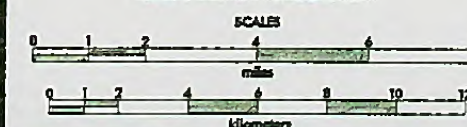


### CURRITUCK COUNTY NORTH CAROLINA

PREPARED BY THE  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS - GIS UNIT

IN COOPERATION WITH THE

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION





### ***Major Collectors***

**NC 12** - The section of NC 12 from Dare County to Corolla provides the only route for travel along the Outer Banks of Currituck County. With the future addition of the Mid-Currituck Bridge, this road will see increased usage from tourists. Due in part to the construction of the Mid-Currituck Bridge, traffic volumes along this stretch of road are projected to reach 15,500 vehicles per typical summer weekday in the year 2025. This amount of traffic necessitates the addition of lanes along NC 12 south of the proposed Mid-Currituck Bridge. Because right-of-way is limited and development is expected to continue to be intense, a four-lane cross section with a raised 4.9 m (16 foot) median is proposed for this road.

**NC 34** - The section of NC 34 between Sligo and Camden County currently carries 3,600 vehicles per average summer weekday. The design and character of this roadway indicate that it can accommodate approximately 10,000 vehicles per day. The traffic projection for the design year is 8,000 vehicles per day in the summer months. While this volume does not necessitate additional traffic lanes, it is approaching the practical capacity of the facility. NC 34 should be investigated toward the end of the planning period to determine whether widening the facility should be pursued after the current planning horizon of 2025.

**New Route** - A proposed bridge across the Currituck Sound between the towns of Coinjock and Corolla, better known as the Mid-Currituck Bridge, is listed in the current TIP (Project R-2576) and is currently undergoing environmental review. This route will provide an additional access for tourists and residents to the rapidly developing Northern Outer Banks area, a more direct access to the rapidly developing area, and provide a much needed additional emergency evacuation route..

### ***Minor Collectors***

**NC 3** - Currently, this road is 6.0 m (20 feet) wide from US 158 to the Currituck Sound. Current traffic volumes range from 190 to 700 vehicles per day. Since this route primarily serves local traffic and major traffic increases are not expected, it is anticipated that the existing cross-section will be adequate to serve future traffic volumes.

**NC 615** - This facility serves the northeastern peninsula of Currituck County known as Knotts Island. Currently, this road carries between 1,100 and 1,500 vehicles per day on average, and the width of the road varies from 4.9 m (16 feet) to 6.0 m (20 feet). Based on the standards for minimum tolerable lane widths, the 4.9 m sections of this road should be widened immediately to a minimum of 6.0 m (20 feet). In addition, based on traffic projections and development trends in this area, it is anticipated that traffic volumes along this route will exceed 3,000 vehicles per day in the year 2025. This will necessitate further widening of this two-lane road to 7.2 m (24 feet) of pavement.

**Waterlilly Road (SR 1142)** - This road, which currently carries up to 800 vehicles per day, ranges in width from 4.9 m (16 feet) to 6.0 m (20 feet). It is the only access to the community of Waterlilly and continues along the length of Church Island. It is recommended that all sections of this road be widened to a minimum of 6.0 m (20 feet).

**North Indian Town Road (SR 1147)** - This road connects NC 34 and US 158 in western Currituck County and continues down the Camden County peninsula into Riddle and Old Trap. In Currituck County, this road is 5.4 m (18 feet) wide. It carries approximately 1,000 vehicles per day, and is projected to carry up to 2,100 vehicles per summer weekday in the design year of 2025. Because of this increase in traffic, it is recommended that this road be widened to a minimum of 6.6 m (22 feet) of pavement.

**Northwest Backwoods Road (SR 1218)** - This facility traverses the northwestern part of county, connecting Camden County with Virginia through Currituck County. The road is 6.0 m (20 feet) wide along its length. Currently carrying up to 1,200 vehicles per day, it is anticipated that this road will carry over 2,000 vehicles per day in the design year. Based on these traffic volumes and the standard for minimum tolerable lane widths, it is recommended that this road facility be widened to a minimum of 6.6 m (22 feet).

**Tulls Creek Road (SR 1222)** - This roadway provides access to many neighborhoods in the north-central section of Currituck County. It is also an alternate route for local drivers who wish to avoid traveling on NC 168. This two-lane road is 5.4 m (18 feet) wide along most of its length and contains some tight curves. Over the past three years, 101 accidents have occurred along this road. Sixty percent of these accidents involved cars running off the road into the ditch. Currently, this road carries between 1,500 and 3,000 vehicles per day. It is anticipated that the land in this area will experience increased development during the planning period, thus dramatically increasing the traffic volumes the road must carry. To improve safety and operations, as well as to accommodate the increasing traffic, it is recommended that this roadway be widened to 7.2 m (24 feet) of pavement with dangerous curves straightened.

**South Mills Road (SR 1227)** - South Mills Road connects the Town of Moyock to Northwest Backwoods Road (SR 1218), which then continues into northern Camden County. This route provides the only crossing of the Great Dismal Swamp in the northern part of county, and is one of only three east-west facilities entering the county. South Mills Road is 5.4 m (18 feet) wide through Moyock to its approximate halfway point, and is then 6.0 m (20 feet) wide for the final 2.9 km (1.8 miles) to SR 1218. Based on current traffic volumes of approximately 1,000 vehicles per day and anticipated traffic volumes in excess of 3,000 vehicles per day, this route should be widened to a minimum of 6.6 m (22 feet) of pavement during the planning period, with 7.2 m (24 feet) being preferred.

**Minor Widening Projects** - In addition to the projects previously mentioned, the following roads in Currituck County are (or have sections that are) 5.4 m (18 feet) wide or less and current traffic volumes greater than 500 vehicles per day. In addition, it is anticipated that future traffic volumes will exceed 1,000 vehicles per day. These roads should be considered for widening to a minimum of 6.6 m (22 feet), with 7.2 m (24 feet) being preferred, during the planning period to improve safety, capacity, and driver comfort.

- SR 1111, Hog Quarter Road
- SR 1131, Poplar Branch Road
- SR 1132, Barnard Road
- SR 1139, Laurel Swamp Road
- SR 1216, Puddin Ridge Road
- SR 1228, Camellia Road
- SR 1232, Poyner's Road
- SR 1245, Bells Island Road
- SR 1246, Maple Road
- SR 1255, Knotts Island Road
- SR 1256, Old Road
- SR 1259, Brumley Road

## Connector Roads

**Connector Roads** - The following connections of secondary roads in southern Currituck County are recommended for two reasons. The first reason is to provide residents with a means to travel around the county without having to access US 158, which becomes very congested during the summer tourist months. The second reason is to consolidate access points onto US 158, thus minimizing the number of future traffic signals that will need to be installed as development continues in this corridor. Although the county commissioners chose to remove these connectors from the plan, they are still recommended as part of this report because of their benefit to NC 168 (see figure 3). The connections include the following:

- Grandy Road (SR 1125)/Poplar Branch Road (SR 1131) Connector - A short connector road is recommended from the intersection of Poplar Branch Road and US 158 west to Grandy Road. No residential or business relocations are anticipated with this proposal.
- Fisher Landing Road (SR 1124)/Forbes Road (SR 1118) Connector - A connection from the intersection of US 158 and Forbes Road to Fisher Landing Road approximately 0.3 km (0.2 miles) west of US 158 is proposed.
- Forbes Road (SR 1118)/North Spot Road (SR 1113) Connector - A connection between southern Forbes Road and North Spot Road is recommended to extend the network of "back roads" in southern Currituck County. This connection, in combination with the two previous projects, will allow residents to travel from Aydlett to Spot without traveling on the potentially congested US 158.
- Harbinger Ridge Road (SR 1103)/Griggs Acres Drive (SR 1163) Connector - A connection between southern Harbinger Road and the northwest end of Griggs Acres Drive is recommended to connect these two neighborhoods and allow for one or two future joint-use signaled accesses onto US 158.

## North Carolina Highway Trust Fund Projects

The Highway Trust Fund Law was established in 1989 as a 13½ year plan with four major goals for North Carolina's roadway network. These goals are:

1. To complete four-lane construction on the 3,600 mile (5,800 km) North Carolina Intrastate System.

2. To construct a multi-lane connector in Asheville and portions of multi-lane loops in Charlotte, Durham, Greensboro, Raleigh, Wilmington, and Winston-Salem.
3. To supplement the secondary roads appropriation in order to pave, by 1999, 10,000 miles (16,000 km) of unpaved secondary roads carrying 50 or more vehicles per day, and all other unpaved secondary roads by 2006.
4. To supplement the Powell Bill Program.

The portion of this law that will most benefit Currituck County is the paving of the unpaved roads on the State maintained system by the end of the planning period. For more information on the Highway Trust Fund Law, contact the Program Development Branch of the North Carolina Department of Transportation.

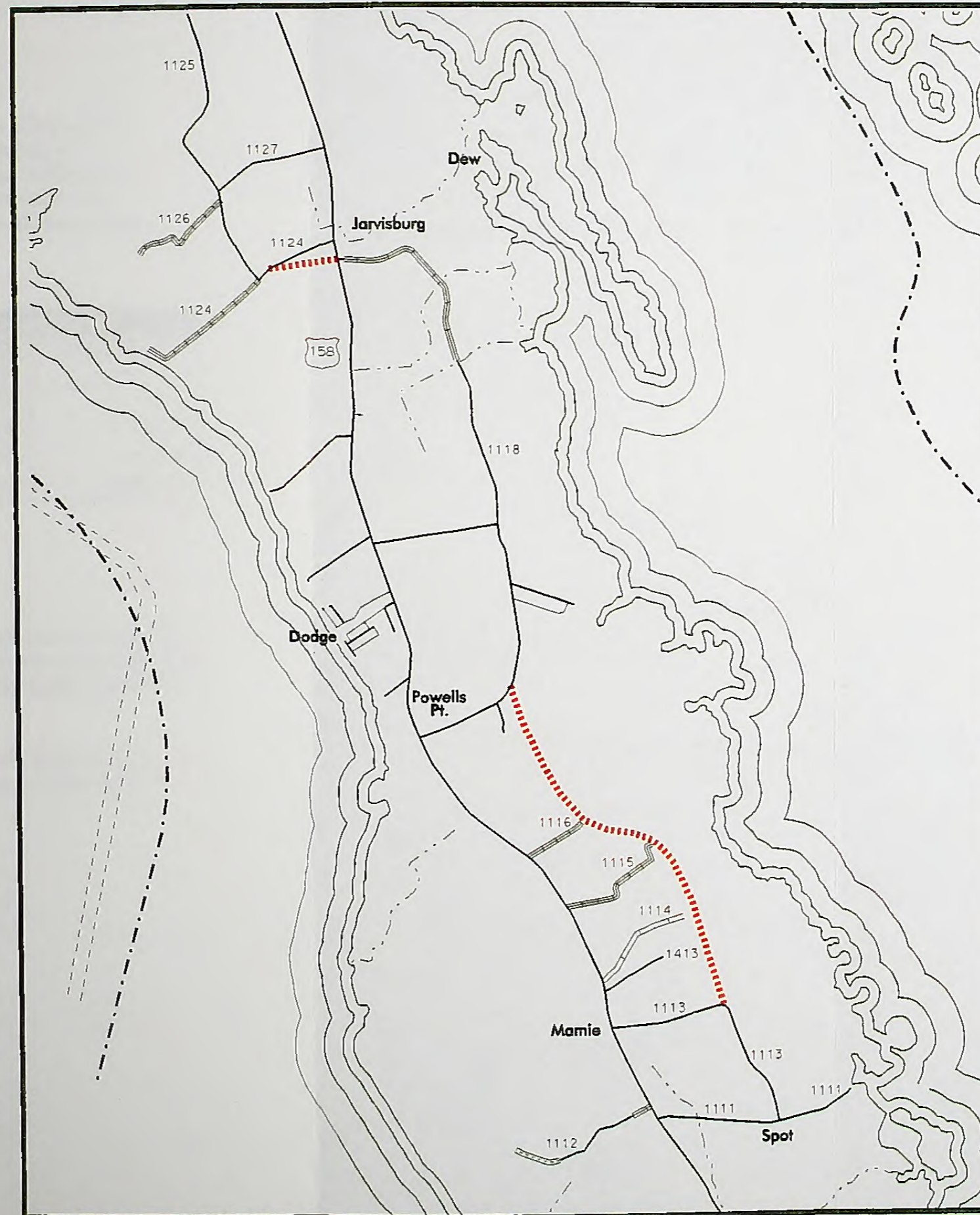
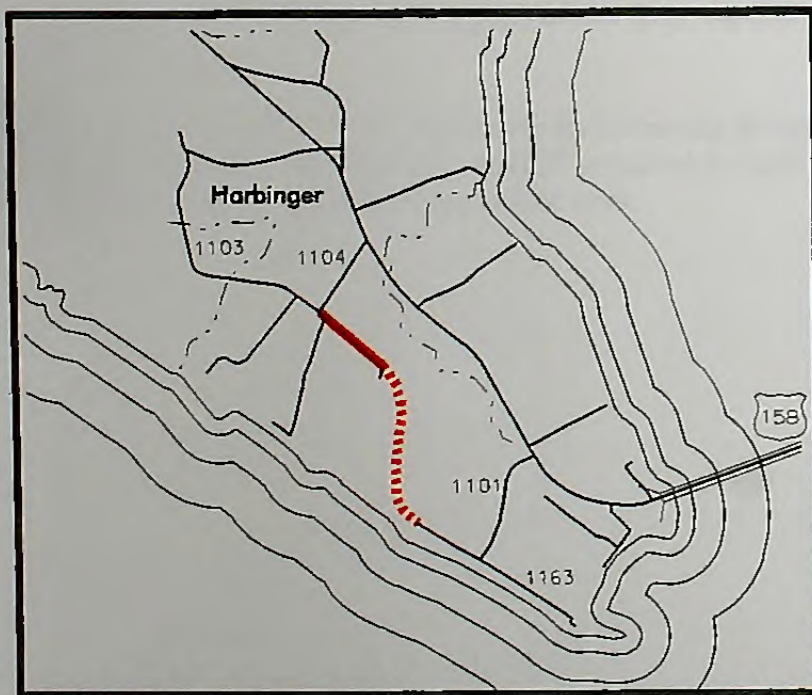
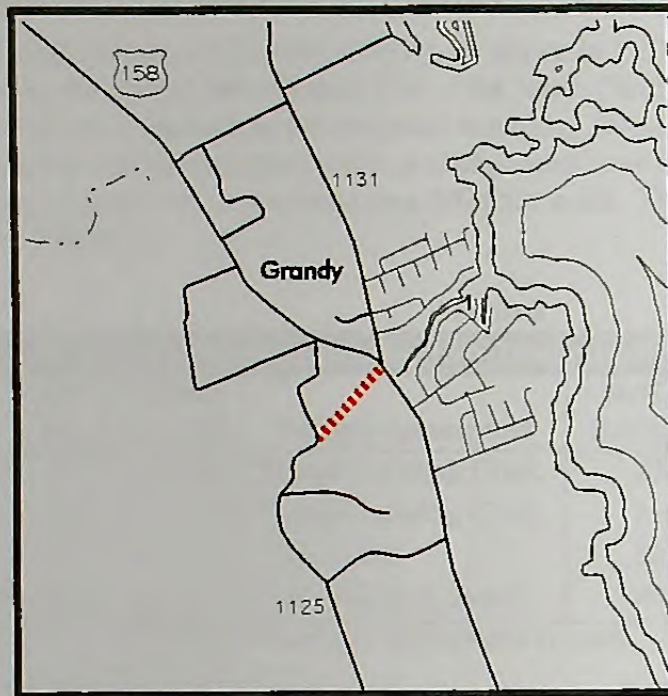
## Construction Priorities and Cost Estimates

Construction priorities vary depending on the criteria considered and the weight attached to these criteria. Most people would agree that improvements to the major thoroughfare system and major traffic routes are more important than improvements to minor thoroughfares where traffic volumes are lower. To be included in the North Carolina Transportation Improvement Program, a project must show favorable benefits relative to cost and should not be prohibitively disruptive to the environment. Thus, to help the State and the County in their efforts to implement the thoroughfare plan, the major projects have been placed in order of priority based on benefit/cost comparisons. The results of this analysis are shown in Table 1. A discussion of the benefit/cost analysis and the computations for the major projects in Currituck County are included in Appendix C.

Table 1

<b>Recommended Improvement Priorities and Cost Estimates for Major Projects</b>		
<b>Project</b>	<b>Cost (millions)</b>	<b>Benefits (millions)</b>
Mid-Currituck Bridge, from Aydlett to Corolla *	\$115.5	\$ 1,192
US 158 @ NC 168 Flyover at Barco*	\$6.7	-
US 158, Widen to 5 lanes from Camden County to NC 168 at Barco *	\$ 16	\$ 85
US 158, Widen to 6 lanes divided from NC 168 to Dare County Line	\$ 235	\$ 610
NC 12, Widen to 4 lanes from Mid-Currituek bridge to Dare County	\$ 28	\$ 35
NC 168 Bypass, 4-lane freeway on new location	\$ 76	\$ 70

\* Included in Draft 2000-2006 State Transportation Improvement Program  
Benefits calculated for a 30-year period beginning in 1995.



# LEGEND

Existing Roadway  
New Location  
2 LANE FACILITY

FIGURE 3  
**CONNECTOR  
ROADS**



**CURRITUCK COUNTY  
NORTH CAROLINA**

DESIGNED BY THE  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS - GIS UNIT  
IN COOPERATION WITH THE  
U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION





## Bridge Replacement Priorities

The deficient bridges in Currituck County are shown in Table 2. This information is supplied by the Bridge Maintenance Unit of the North Carolina Department of Transportation. Data such as the estimated remaining life of the bridge, condition of superstructure and substructure, width, and alignment were used to determine their sufficiency ratings, which are based on a 100 point scale. The location of these bridges is shown in Figure 7.

Table 2

Recommended Bridge Improvement Priorities						
Brg. No.	SD/ FO	Facility Carried	Feature Intersected	Suff. Rating	1995 ADT	Replacement Cost
6	SD	SR 1228	Shingle Landing Creek	23.8	1,000	\$ 179,000
28*	SD	SR 1222	Shingle Landing Creek	31.6	900	\$ 786,000
3	SD	SR 1232	Tulls Creek	32.2	550	\$ 268,000
19*	FO	NC 615	Ferry Ramp at Sound	40.5	1,100	\$3,000,000

\* Included in the 2000-2006 Transportation Improvement Program

SD = Structurally Deficient

FO = Functionally Obsolete

## Ferry System Improvements

The Currituck-Knotts Island ferry is a critical link between the mainland and Knotts Island. In 1997, it carried 88,848 passengers and 26,670 vehicles. This was an increase of 163% and 177% respectively, from 1985. The capacity of this ferry, especially during the school year, was a primary concern.

The Ferry Division evaluated two alternatives for increasing the capacity of the Currituck-Knotts Island ferry. In February 1998, NCDOT approved the enlargement of the ferry. Construction should be complete by the Fall of 1999.



## **Chapter 3**

### **Implementation**

Once the thoroughfare plan has been developed and adopted, implementation is one of the most important aspects. Unless implementation is an integral part of the process, the effort and expense associated with developing the plan is lost. There are several tools available for use by the County to assist in the implementation of the thoroughfare plan. These tools are described below.

#### **State-County Adoption of Thoroughfare Plan**

The first step in the implementation process is the mutual adoption of the thoroughfare plan, as shown in Figure 1, by Currituck County and the North Carolina Department of Transportation. The mutually approved plan may then serve as a guide for the Department of Transportation in the development of the road and highway system for the County. The adoption of the plan by the County also enables standard road regulations and land use controls to be used effectively in the implementation of this plan.

#### **Corridor Preservation**

The next step in implementing the thoroughfare plan is corridor preservation. Corridor preservation is a critical step in the implementation process because it minimizes the disruption of future road construction on the local residents and businesses, as well as on the environment. Through measures such as subdivision, land use, and development regulations, the County can protect the necessary rights-of-way for the recommended improvements.

##### ***Subdivision Controls***

Subdivision regulations require every subdivider to submit to the County Planning Commission a plan of any proposed subdivision. It also requires that subdivisions be constructed to certain standards. Through this process, it is possible to require the subdivision streets to conform to the thoroughfare plan and to reserve or protect necessary rights-of-way for projected roads and highways that are to become a part of the thoroughfare plan. The construction of subdivision streets to adequate standards reduces maintenance costs and simplifies the transfer of streets to the State Highway System.

*This tool would be applicable to the construction of any new facilities, such as the NC 168 Bypass. Ensuring that subdividers include planned transportation facilities in their designs can help reduce highway construction costs and possible disruption to future homes and businesses.*

##### ***Land Use Controls***

Land use regulations are an important tool in that they regulate future land development and minimize undesirable development along roads and highways. The

land use regulatory system can improve highway safety by requiring sufficient setbacks to provide for adequate sight distances and by requiring off-street parking.

*This tool would be applicable to facilities that are recommended to be widened to multiple lanes, such as US 158 from Camden County to NC 168. Land use controls can help to ensure that these facilities will maintain their intended capacities by regulating the types of land use that develop along the roads.*

### **Development Regulations**

Driveway access to a State-maintained street or highway is reviewed by the District Engineer's office and by the Traffic Engineering Branch of the North Carolina Department of Transportation. In addition, any development expected to generate large volumes of traffic (e.g., shopping centers, fast food restaurants, or large industries) may be comprehensively studied by staff from the Traffic Engineering Branch, Statewide Planning Branch, and/or Roadway Design Unit of NCDOT. If done at an early stage, it is often possible to significantly improve the development's accessibility while preserving the integrity of the thoroughfare plan. Since the County is the first point of contact for developers, it is important that the County advise developers of this review requirement and cooperate in the review process.

*It is anticipated that US 158 and NC 168 will experience increased development throughout the planning period. Use of development regulations can help control increasing traffic and congestion along these roads.*

## **Funding**

The final step in the implementation process is to obtain funding for each project. Sources such as the Transportation Improvement Program, small urban funds, enhancement funds, and industrial access funds are a few examples of funding sources available to the County.

### **Transportation Improvement Program**

North Carolina's Transportation Improvement Program (TIP) is a document which lists major construction projects the Department plans for the next seven years. TIP projects are matched with project funding sources. Every two years when the TIP is updated, completed projects are removed, programmed projects are advanced, and new projects are added.

Public input into the State TIP is via bi-annual public hearings. At these public hearings, municipalities, county governments, the general public, and others request projects to be included in the TIP. A Board of Transportation Member reviews all of the project requests in his or her division. Based on technical feasibility, need, and available funding, the Board Member decides which projects will be included in the TIP. In addition to highway construction and widening, TIP funds are also available for other projects including bridge replacement, highway safety, public transit, railroad crossings, and bicycle facilities.

### ***Enhancement Funds***

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 provides federal funds for transportation enhancement activities. These activities must have a direct relationship to the intermodal transportation system. This relationship may be one of function, proximity, or impact. Activities that may be eligible for these funds include: pedestrian and bicycle facilities; acquisition of scenic easements and scenic or historic sites; scenic or historic highway programs; landscaping and other scenic beautification; historic preservation; rehabilitating and operating historic transportation buildings, structures, or facilities; preserving abandoned railway corridors; controlling and removing outdoor advertising; archaeological planning and research; and mitigating water pollution due to highway runoff. For additional information concerning these funds, contact the Program Development Branch of the NC Department of Transportation.

### ***Industrial Access Funds***

Industrial Access funds are used by the Department to finance both new highway construction and improvements to existing roads or bridges as an incentive to develop industrial interests. For example, if an industry wishes to develop property that does not have access to a state maintained highway and certain economic conditions are met, then funds may be available for construction of an access road. For additional information concerning these funds, contact the Program Development Branch of the NC Department of Transportation.



## Chapter 4

### Trends and Related Issues

The objective of thoroughfare planning is to develop a transportation system that will meet future travel demand and enable people and goods to travel safely and economically. To determine the needs of an area, it is important to understand the role of population, the economy, land use, and vehicle registration and use.

### Population

The amount of traffic on a section of road is a function of the size and location of the population it serves. Investigating past trends in population growth and forecasting future population growth and dispersion is one of the first steps for a transportation planner. Table 3 shows population trends and forecasts for Currituck County, while Table 4 shows trends for the individual townships. This information illustrates the steady growth that is taking place in the county and is anticipated to continue well into the next century.

**Table 3**

<b>County Population Growth</b>		
<b>Year</b>	<b>Population</b>	<b>Growth</b>
1970	6,976	...
1980	11,089	+ 4,113
1990	13,736	+ 2,647
* 2000	17,590	+ 3,854
* 2010	21,030	+ 3,440
* 2020	24,466	+ 3,436
** 2025	26,184	+ 1,718

\* Projections from Office of State Budget and Management, Demographics Unit

\*\* Estimate

**Table 4**

<b>Township Population Growth</b>				
<b>Township</b>	<b>1970</b>	<b>1980</b>	<b>1990</b>	<b>Growth, '70-'90</b>
Crawford	2,487	3,974	4,936	+ 2,449
Fruitville	508	906	1,140	+ 632
Moyock	1,494	3,095	3,090	+ 1,596
Poplar Branch	2,487	3,114	4,570	+ 2,083

However, residential population figures are only part of the story in Currituck County. During the summer months, the population swells to accommodate tourists traveling to and through the county. As shown in Table 5, the 1990 Census indicated that there were 7,367 housing units in the county. Of these, over 40% were seasonal units. This is a tremendous increase in seasonal housing over previous censuses, and the trend is expected to continue. This increase in summertime-only housing corresponds directly with the increased traffic and

congestion in Currituck County during the summer months. For this reason, both yearly averages and summer weekday traffic along the major routes in the county was studied in developing this thoroughfare plan (see the *Travel Demand* section of this report for further discussion of summer weekday traffic).

**Table 5**

<b>Housing Units in Currituck County</b>			
<b>Year</b>	<b>Housing Units</b>	<b>Seasonal Units</b>	<b>Year-round Units</b>
1970	2,735	134	2,599
1980	5,405	704	4,699
1990	7,367	3,094	4,273

## **Economy and Employment**

One of the more important factors to be considered in estimating the future traffic growth of an area is its economic base. The economic base determines the employment type and size, as well as commuter traffic patterns around the county. This in turn influences the population of an area. Employment figures for Currituck County show that in 1990 there were 6,397 employed residents. Of these residents, over 60% (3,902 residents) commuted to jobs *outside* Currituck County each day. Almost three-fifths of these out-commuters were employed just north of Currituck County in the Chesapeake Bay area of Virginia. There were also 906 people who commuted *into* Currituck County each day for employment, the largest segment of which (312) came from Dare County.

The imbalance between in-commuters and out-commuters indicates that the county serves as a "bedroom" community to nearby larger employment centers. This development pattern is expected to continue. The commuting imbalance, and the longer distances people typically travel to work, causes increased strain on the major road arteries during morning and afternoon peak rush hours. Commuting information for Currituck County is summarized in Table 6.

## **Land Use**

Land use refers to the physical patterns of activities and functions within a city or county. Nearly all traffic problems in a given area can be attributed in some form to the type of land use. For example, a large amount of seasonal housing might be the cause of congestion during summer weekends as people come and go. However, during the remainder of the week few problems, if any, may occur. The spatial distribution of different types of land use is the predominant determinant of when, where, and why congestion occurs. The attraction between different land uses and their association with travel varies depending on the size, type, intensity, and spatial separation of each.

Table 6

<b>Commuting Patterns (100+ Commuters)</b>		
<b>Location of Residence</b>	<b>Location of Work</b>	<b>Number of Commuters</b>
Currituck County	Chesapeake Bay Area	2,278
Currituck County	Dare County	876
Currituck County	Pasquotank County	379
Dare County	Currituck County	312
Chesapeake Bay Area	Currituck County	202
Pasquotank County	Currituck County	168
Total Number of People Commuting from Currituck County		3,902
Total Number of People Commuting to Currituck County		906
Total Number of Employed Residents Living in Currituck County		6,397
Total Number of People Employed in Currituck County		3,401

Data from the 1990 Census of Population and Housing.

- \* The Chesapeake Bay Area consists of the following areas in southeast Virginia: Norfolk, Chesapeake, Virginia Beach, Portsmouth, Suffolk, Hampton, and Newport News.

Typically in transportation planning, land uses are grouped into four categories:

1. Residential - all land devoted to the housing of people (excluding hotels and motels);
2. Commercial - all land devoted to retail trade, including consumer and business services and offices;
3. Industrial - all land devoted to manufacturing, storage, warehousing, and transportation of products; and
4. Public - all land devoted to social, religious, educational, cultural, and political activities.

Anticipated future land use is a logical extension of the present spatial distribution. Determination of where expected growth is to occur within the planning area facilitates the location of proposed thoroughfares or the improvements of existing thoroughfares.

In coastal communities, service industries that cater to tourists, such as hotels, restaurants, and shopping areas, are typically more prevalent than in other areas of the state. These land uses generate a significant amount of traffic when compared to other types of land use. The increased strain that these developments contribute to the highway system is especially felt during the summer season, when tourist traffic is at its peak. In Currituck County, this type of development is on the increase and will most likely continue to increase throughout the planning period. It is expected that most of this development will occur along existing major highway corridors, such as US 158 and NC 168. Currituck County should closely monitor

the development, as well as the access points provided to each development, in order to successfully preserve the traffic carrying capacity of these two routes.

In addition to the service related developments, Currituck County is experiencing increasing residential development pressure in the northern part of the county. This development is overflowing from the Chesapeake Bay Area of Virginia, and is attracted to Currituck County because of the lower cost of living. Significant increases in residential development in this area should be expected during the planning period. This development will have primarily have an effect on NC 168 in the northern part of the county.

The Land Use Plan completed for Currituck County in 1990 identifies the location of preferred types of development in seven different categories. These categories include: developed, urban transition, limited transition, community, rural with services, rural, and conservation. The Land Use Plan Classification map from this report is shown in Figure 3.

## Vehicle Registration

Since 1970, the number of registered vehicles in the county has increased at a greater rate than the population. This increase can be shown best by comparing the change in the number of persons per vehicle over time. This ratio is obtained by dividing the total population of the area by the total number of vehicles registered in that area. Table 7 shows this comparison for North Carolina and Currituck County and includes projections to the year 2025. The results illustrate the transition from a non-automobile oriented society to one whose vitality is heavily dependent on the automobile. This change in lifestyle has gradually occurred over many years. As shown in Table 7, there are more vehicles available per person now than ever before. Because of this convenience, more vehicle trips are made and fewer trips are consolidated into "multi-purpose" trips. Thus, traffic and congestion are growing on our road system at a faster rate than the associated population.

Table 7

Persons per Vehicle Trends		
Year	Currituck County	North Carolina
1970	2.04	2.03
1980	1.50	1.52
1990	1.33	1.35
*2000	1.20	1.24
*2010	1.12	1.15
*2020	1.08	1.11
*2025	1.05	1.09

\* Estimated

## Travel Demand

Average annual daily traffic volumes (AADT) for 1995 on selected major roads and highways in Currituck County are shown in Figure 4. Also shown are projections for the year 2025, assuming no changes to the existing street system are made. These projections

were based on historic and anticipated population, economic growth patterns, and land use trends.

Typically, AADTs are used in the analysis of roadway capacity deficiencies for an area. However, because of its location on the coast, Currituck County's traffic volumes vary considerably with the seasons. The county experiences its peak traffic volumes on summer weekends when tourists are traveling to and/or through the area. This is shown graphically in Figure 5, which compares a major highway in Currituck County with a major highway in the Piedmont section of the state. As shown, the month-by-month traffic in the Piedmont is relatively steady, while there is a definite peak in traffic during the summer at the coast. To ensure that congestion in Currituck County is minimized throughout the year, the thoroughfare plan would have to provide for the peak summer weekend traffic. However, a significant amount of money (and pavement) would be needed to accommodate these few summer weekends per year. Thus, a compromise was reached.

The goal of the Currituck County Thoroughfare Plan is to provide adequate travel service along the major thoroughfares during the *summer weekdays*. This goal serves the residents of the county by providing for their daily trips to and from work and for accomplishing daily activities during the week. By nature of the county's location, summer weekends will continue to bring congestion and traffic from out-of-town travelers. This is an actuality with which the residents will have to co-exist. Figure 6 shows summer weekday traffic volume estimates for 1995 and 2025. These traffic volumes and projections were used in the capacity analysis of Currituck County's road system.

Although minimum requirements are necessary for all roads serving the public, the ultimate design of a road will vary according to the desired capacity and level-of-service to be provided. Universal standards in the design of thoroughfares are not practical. Each road or highway section must be individually analyzed and its design requirements determined by the amount and type of projected traffic, existing capacity, desired level of service, and available right-of-way.

Many different factors contribute to the capacity of a roadway. These factors include:

1. Geometrics of the road, including:
  - number of lanes
  - horizontal and vertical alignment
  - proximity of perceived obstructions to safe travel along the road
2. Typical users of the road, including:
  - commuters
  - recreational travelers
  - truck traffic
3. Access control (including streets and driveways), or lack thereof, along the road;
4. Development along the road, such as:
  - residential
  - commercial

- industrial
- 5. Number of traffic signals along the route;
- 6. Peaking characteristics of the traffic on the road:
  - rural roads tend to have a higher morning and afternoon peak period increase in traffic as compared to mid-day traffic
- 7. Characteristics of side-roads feeding into the road; and
- 8. Directional split of traffic, or the percentage of vehicles traveling in each direction along a road at any given time.

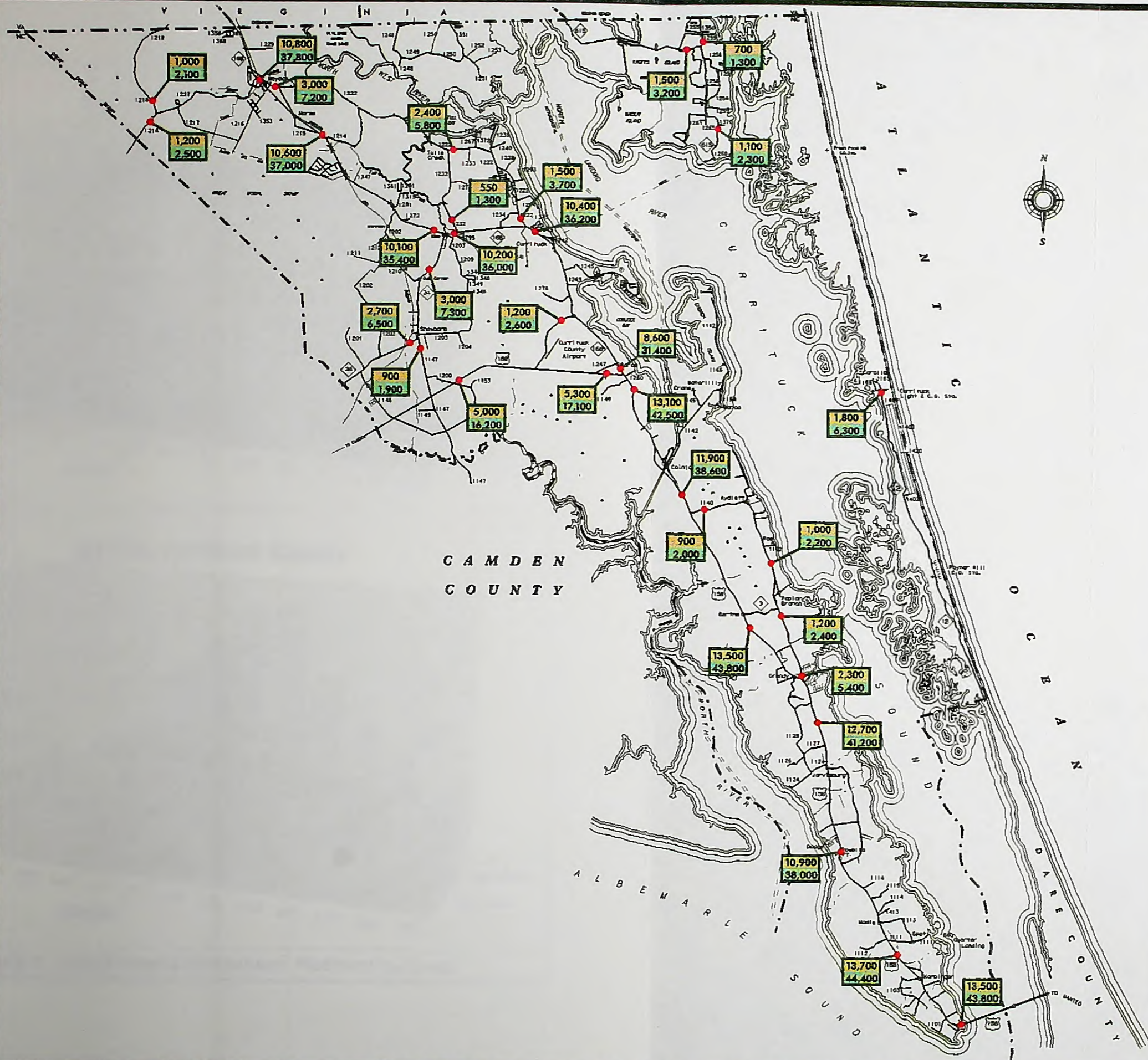
Because of these many factors, and due to the changing nature of roads and their surroundings as time progresses, it is very difficult to determine an exact point at which a road will reach its capacity. At the thoroughfare planning level, the capacity of a road is estimated using the factors above and comparing them to other roads in the state with similar, but more progressed, circumstances. Table 8 shows approximate capacities for various type of roadways in settings with different intensities of surrounding development. These capacities are measured in vehicles per day.

**Table 8**

<b>Road Capacities (in vehicles per day)</b>			
<b>Development &gt;&gt;&gt;</b>	<b>High Intensity</b>	<b>Medium Intensity</b>	<b>Low Intensity</b>
<b>2-lane road</b>	8,000	10,000	12,000
<b>3-lane road</b>	12-16,000	15-18,000	20,000
<b>4-lane road:</b>			
<b>undivided</b>	18-22,000	30-35,000	45,000
<b>divided</b>	18-22,000	35-40,000	48,000
<b>5-lane road</b>	24-28,000	32-38,000	47,000
<b>4-lane freeway</b>	54,000		
<b>6-lane freeway</b>	81,000		

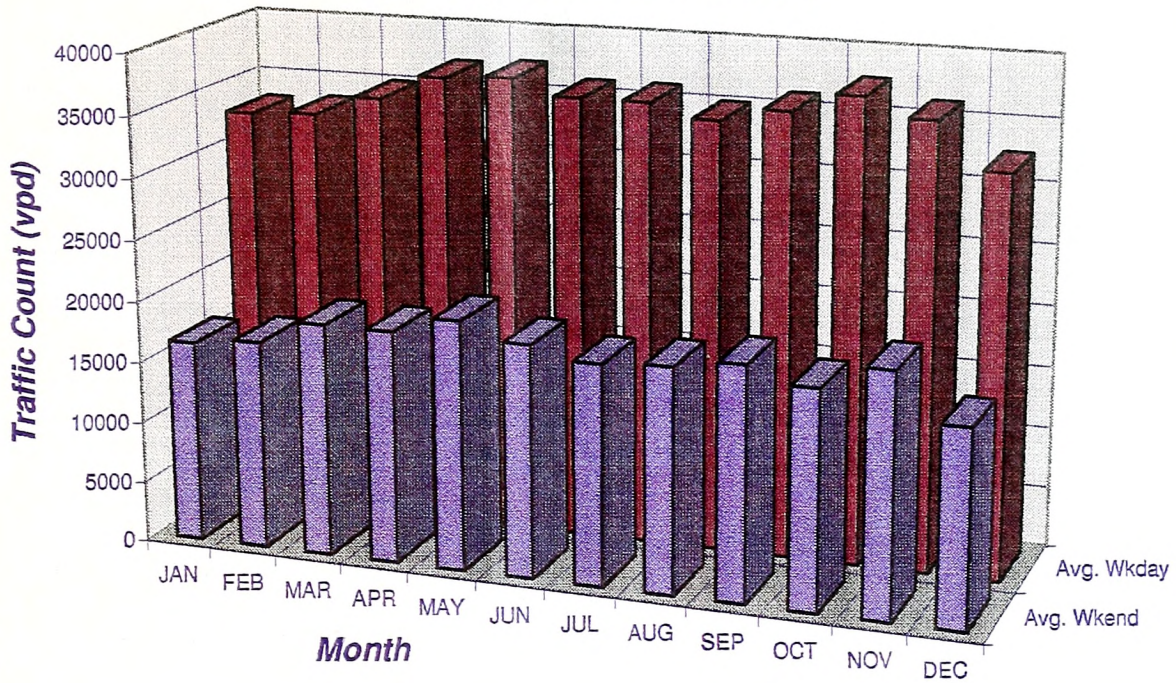
- Above capacities assume 3.6 m (12') lanes, 5% trucks, a 60/40 directional split of traffic, level of service D.
- *Low intensity* locations assume sparse rural development and uninterrupted flow on the roadway.
- *Medium intensity* locations assume typical suburban-type development with approximately 2 signals per mile and less than 10 other intersections per mile.
- *High intensity* locations assume dense urban development with closely spaced traffic signals and no street or driveway access control.

For driver convenience, ease of operation, and safety, it would be desirable to widen all existing roads and highways to provide a minimum lane width of 3.6 m (12 feet). However, when considering overall statewide needs and available highway revenue, these levels of improvement applied statewide would be impractical. Therefore, it is necessary to establish minimum tolerable widths for existing roads with respect to traffic demands that would be economically feasible. The widths used in determining the existing lane deficiencies in the County are given in Table 9.





### NC 147, Durham County



### US 158, Currituck County

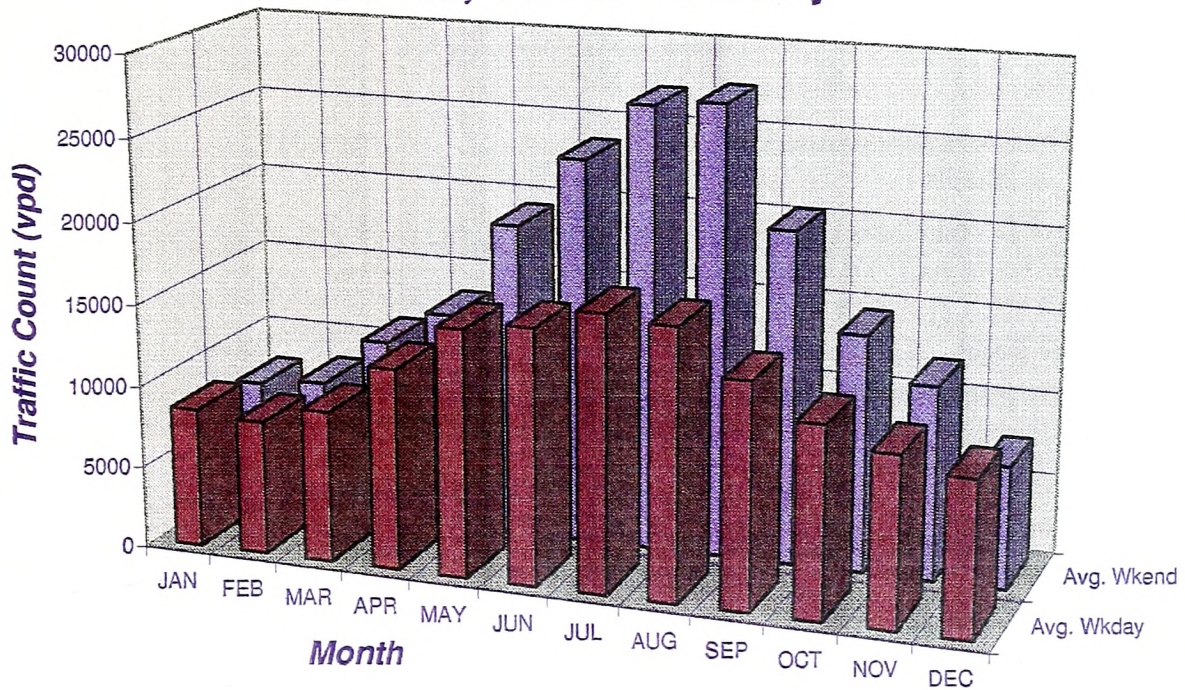


Figure 5 Traffic Volume Comparison, Piedmont vs. Coast

Small corner label

Small label on right edge





Table 9

<b>Minimum Tolerable Lane Widths</b>			
<b>Average Daily Traffic</b>	<b>Principal Arterials (feet)</b>	<b>Minor Arterials (feet)</b>	<b>Collectors (feet)</b>
Over 2,000	11	11	11
400 - 2,000	-	10	10
100 - 400	-	10	9
Below 100	-	-	9

## **Transportation Improvement Program Projects**

The Transportation Improvement Program (TIP) is a seven year project document that lists the major transportation improvement projects that the Department of Transportation has planned. These projects include not only roadway projects, but also bridge projects, railroad crossings, bicycle facilities, and public transportation. Currituck County has three major roadway projects identified in the Draft State 2000-2006 TIP, which are listed below:

1. TIP #R-2574: US 158, west of SR 1204 in Camden County to NC 168 -- Widen roadway to a multi-lane facility (TIP Project R-2574). Post year construction, which means that sufficient funding is not available during the current years for this project.
2. TIP #R-2576: New route, Mid-Currituck Bridge, linking Coinjock to Corolla – Construct a new structure over the Currituck Sound and upgrade approaches. This project is currently in the environmental review stage of planning
3. TIP #R-4011: US 158 and NC 168, Construct flyover at intersection. Construction scheduled for year 2002.



# Chapter 5

## Travel Deficiency Analysis

This chapter presents an analysis of the ability of the existing street system to serve the area's travel desires. Emphasis is placed not only on detecting the deficiencies, but on understanding their causes. Travel deficiencies may be localized and the result of a substandard highway design, inadequate pavement width, or intersection controls. Alternately, the underlying problem may be caused by a system deficiency, such as a need for a bypass, loop facility, additional radials, or construction of missing links.

An analysis of the roadway system must first look at existing travel patterns and identify existing deficiencies. This includes roadway capacity and safety analysis. After the existing picture of travel in the area has been developed, the engineer must analyze factors that will impact the future system. These factors include forecast population growth, economic development potential, and land use trends. This information will be used to determine future deficiencies in the transportation system.

### Capacity Deficiency Analysis

A good indication of the adequacy of the existing major street system is a comparison of the traffic volumes with the ability of the streets to move traffic freely and at a desirable speed. Capacity is defined as the maximum number of vehicles that can pass over a given section of roadway during a given time period under prevailing roadway and traffic conditions.

Because Currituck County is a coastal area, traffic volumes along the major routes vary considerably with the seasons. In particular, the summer months attract a significant number of beach-going tourists, thus causing an increased strain on the highway network. Average traffic volumes in the summer are typically 25% higher than the yearly average, with peak summer weekends being 50-100% higher than the average. For this reason, the capacity analysis for roads in Currituck County was done on *average summer weekday* traffic. This analysis was done for both the base year, 1995, and the design year, 2025. The average summer weekday traffic counts at selected locations in the county are shown in Figure 6.

The relationship of traffic volumes to the capacity of the road determines the level of service being provided. The level of service (LOS) is a qualitative measure describing the operating conditions within a traffic stream and their perception by motorists and/or passengers. Six levels of service are used to identify the conditions existing along a highway or street. They are given letter designations, from LOS "A" to LOS "F," with LOS "A" representing the best operating conditions and LOS "F," the worst.

The recommended improvements in the thoroughfare plan were based on achieving a minimum LOS "D" on existing facilities and LOS "C" on new facilities. LOS "D" is considered the "practical capacity" of a facility, or that point at which the public begins to

express dissatisfaction. These levels of service are defined and illustrated in Appendix E of this report.

### **1995 Analysis**

The comparison of current average summer weekday traffic volumes in Currituck County with the existing road capacities indicates that no roads in Currituck County are currently over capacity. However, NC 168 carries between 10,000 and 12,000 vehicles per day, which is right at the practical capacity of a two-lane road. These figures increase to over 14,000 vehicles per day during the typical summer weekday, causing congestion and decreased safety to the traveling public. This situation is being remedied by the upgrade of the roadway to a five-lane cross section, which should be complete by the year 2000.

### **2025 Analysis**

During the planning period from 1995 to 2025, three major facilities are expected to exceed their practical capacities. These include:

- US 158, from Camden County to NC 168
- US 158, from NC 168 to the Wright Memorial Bridge
- NC 168, from US 158 to the Virginia State Line

Two of these deficiencies are already being addressed in the current Transportation Improvement Program (TIP). The first is the widening of US 158 from Camden County to NC 168 to a multi-lane facility. This project is listed as an Identified Future Need in the TIP (Project R-2574) and will receive funding as it becomes available. The second project is the construction of the Mid-Currituck Bridge (TIP Project R-2576), which will remedy the anticipated congestion problems on the southernmost portion of US 158.

However, two deficiencies will still need to be addressed through the thoroughfare planning process. These include: the need to further widen NC 168 past the five-lane cross section which is currently under construction, and the widening of a portion of US 158 between NC 168 and the new Mid-Currituck Bridge. In addition, other narrow two-lane roadways in the county will experience increased traffic during the planning period and should be widened to a standard two-lane cross section.

Complete recommendations for these facilities are included in Chapter 2 of this report.

## **Traffic Accident Analysis**

Traffic accidents are often used as an indicator for locating congestion problems. Traffic accident records can be reviewed to identify problem locations or deficiencies such as poor design, inadequate signing, ineffective parking, or poor sight distance. Accident patterns developed from the analysis of accident data can lead to improvements that will reduce the number of accidents.

Table 10 provides a summary of the accidents occurring in Currituck County for the three year period between October, 1993, and September, 1996. This table only includes locations with 6 or more accidents. Both the number and severity of accidents are considered when investigating accident data.

As a part of this study, these accident locations were reviewed with the NCDOT Division Traffic Engineer. The NCDOT Division is actively involved with investigating and improving many of these locations. To request a more detailed analysis for any of the intersections listed below, or other intersections of concern, the County should contact the Division Traffic Engineer.

**Table 10**

Locations with > 6 Accidents							
Location	# of Accidents	# of Injuries	Severity Code *				Predominant Type
			F	A	B	C	
US 158 at SR 1131	7	6	1	4	1		ran off road, left turn
US 158 at SR 1186	19	19	4	8	7		angle, left turn
NC 34 at NC 168	11	6			3	3	various
NC 168 at SR 1203	6	1				1	various
NC 168 at SR 1216	6	6			2	4	angle
NC 168 at SR 1222	17	13			1	12	rear end
NC 168 at SR 1227	10	9	2	4	3		rear end, left turn
NC 168 at SR 1228	12	11			4	7	rear end, angle
NC 168 at SR 1232	11	17	7	1	9		rear end
NC 168 at SR 1234	10	11			5	6	rear end
NC 168 at SR 1242	11	7			3	4	rear end, ran off road
NC 168 at SR 1246	15	15			2	13	rear end

**\* Key to Severity Codes:**

- F - Fatality
- A - Class "A" Injury - Incapacitating. The injury is obvious and severe enough to prevent carrying on normal activities for at least 24 hours; e.g., massive loss of blood or broken bone.
- B - Class "B" Injury - Non-incapacitating. In this case, an injury other than a fatality or Class "A" injury is evident.
- C - Class "C" Injury - No visible sign of injury, but complaint of pain or momentary loss of consciousness occurs.

## Bridge Conditions

Bridges are a vital and unique element of a highway system. First, they represent the highest unit investment of all elements of the system. Second, any inadequacy or deficiency in a bridge reduces the value of the total investment. And third, a bridge represents the greatest opportunity of all highway failures for loss of life. For these reasons, it is imperative that bridges be well constructed and inspected at regular intervals to ensure the safety of the traveling public.

All bridges in North Carolina are inspected at least once every two years, as required by federal standards, by NCDOT's Bridge Maintenance Unit. A sufficiency rating is calculated for each bridge to establish eligibility and priority for replacement. The bridges with the highest priority are replaced as Federal and State funds become available.

The sufficiency rating was used in this analysis to determine the deficiency of each bridge. The sufficiency rating measures several factors to determine whether a bridge is sufficient to remain in service, including: structural adequacy and safety; serviceability and functional obsolescence; essentiality for public use; type of structure; and traffic safety features. The result of this method is a percentage in which 100 percent represents an entirely sufficient bridge and zero percent represents an entirely insufficient or deficient bridge. A sufficiency rating of 50 percent or less qualifies for Federal Bridge Replacement Funds.

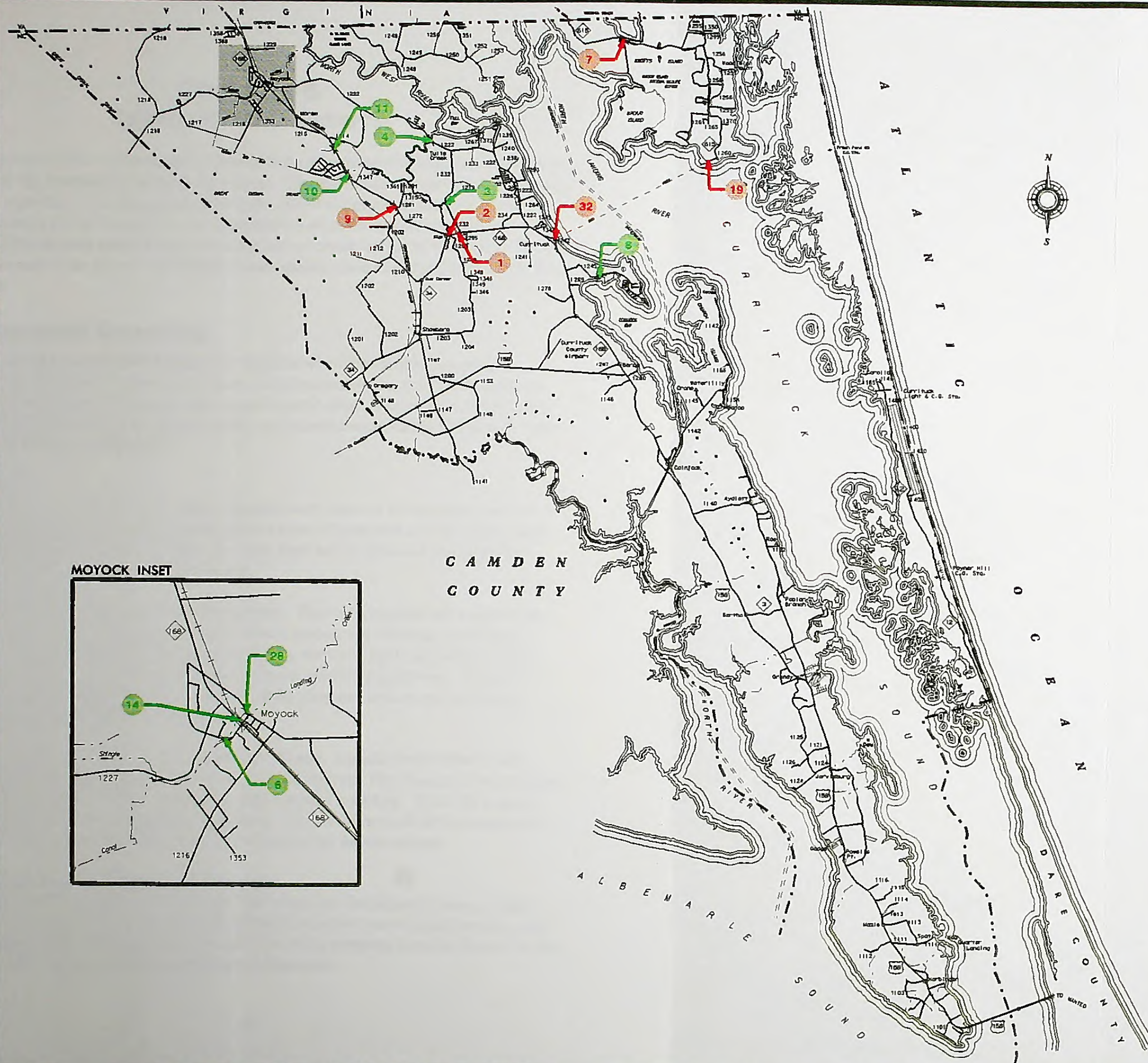
Deficient bridges are categorized as either structurally deficient or functionally obsolete. Structurally deficient bridges score below average in deck superstructure, substructure, overall structural condition, or waterway adequacy. Bridges in the functionally obsolete category have below average ratings in approach roadway alignment, under clearance, deck geometry, waterway adequacy, or structural condition. Table 11 shows functionally obsolete bridges and Table 12 shows structurally deficient bridges in Currituck County. The location of these bridges is shown in Figure 7.

**Table 11**

<b>Functionally Obsolete Bridges</b>		
<b>Bridge Number</b>	<b>Sufficiency Rating</b>	<b>Location</b>
1	51.3	NC 168 at Duckskin Creek
2	51.3	NC 168 at Cowell's Creek
7	32.0	NC 615 at Creek
9	49.9	NC 168 at New Bridge Creek
19	40.5	NC 615 Ferry Ramp at Currituck Sound
32	26.6	SR 1242 Ferry Ramp at Currituck Sound

**Table 12**

<b>Structurally Deficient Bridges</b>		
<b>Bridge Number</b>	<b>Sufficiency Rating</b>	<b>Location</b>
3	32.2	SR 1232 at Tulls Creek
4	31.2	SR 1222 at Tulls Creek
6	23.8	SR 1228 at Shingle Landing Creek
8	4.0	SR 1245 at Coinjock Bay
10	52.0	NC 168 at Guinea Mill Run
11	31.5	NC 168 at Roland Creek
14	62.6	NC 168 at Shingle Landing Creek
28	31.6	SR 1222 at Shingle Landing Creek



# LEGEND

- Structurally Deficient Bridges
- Functionally Obsolete Bridges

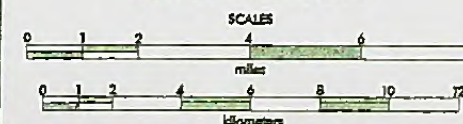
FIGURE 7  
**DEFICIENT  
BRIDGES**

**CURRITUCK COUNTY  
NORTH CAROLINA**

PREPARED BY THE  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS - GIS UNIT

IN COOPERATION WITH THE

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION





## **Chapter 6**

### **Environmental Concerns**

In the past several years, environmental considerations associated with highway construction have come to the forefront of the planning process. The legislation that dictates the necessary procedures regarding environmental impacts is the National Environmental Policy Act (NEPA). Section 102 of this act requires the execution of an Environmental Impact Statement (EIS) for road projects that have a significant impact on the environment. The EIS covers the impact of the project on wetlands, water quality, historic properties, wildlife, and public lands.

### **Environmental Screening**

Projects on the Thoroughfare Plan underwent an informal environmental screening to evaluate potential impacts in several key areas of environmental concern. These areas are wetlands, threatened and endangered species, and historic sites. A discussion of each issue and the potential impacts to it are found below. An environmental map of Currituck County is provided in Figure 8 and Figure 9.

#### ***Wetlands***

In general terms, wetlands are lands where saturation with water is the dominant factor in determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. Most wetlands have soil or substrate that is at least periodically saturated with or covered by water.

Wetlands are crucial ecosystems in our environment. They help regulate and maintain the hydrology of our rivers, lakes, and streams by slowly storing and releasing flood waters. They help maintain the quality of our water by storing nutrients, reducing sediment loads, and reducing erosion. They are also critical to fish and wildlife populations. Wetlands provide an important habitat for about one third of the plant and animal species that are federally listed as threatened or endangered.

In Currituck County, wetlands are a very prevalent feature. Locations of wetlands were reviewed to determine the best corridor for the NC 168 Bypass. The remaining thoroughfare plan proposals are located within or along existing roadway corridors. Thus, the impact to significant wetlands in those areas will be minimal. The Mid-Currituck Bridge is currently under study, therefore no additional analysis was conducted for this project.

#### ***Threatened and Endangered Species***

A preliminary review of the Federally Listed Threatened and Endangered Species within Currituck County was done to determine the effects that any proposed improvements could have on these species. These species were identified using mapping from the North Carolina Department of Environment, Health, and Natural Resources.

The Threatened and Endangered Species Act of 1973 allows the US Fish and Wildlife Service to impose measures on the Department of Transportation to mitigate the environmental impacts of a road project on endangered plants and animals and critical wildlife habitats. By locating rare species in the planning stage of road construction, we can avoid or minimize these impacts.

A detailed field investigation of these corridors is recommended prior to the construction of any of these projects.

### ***Historic Sites***

The location of historic sites in Currituck County was investigated to determine the possible impact of the various projects studied. The federal government has issued guidelines requiring all State Transportation Departments to make special efforts to preserve historic sites. In addition, the State of North Carolina has issued its own guidelines for the preservation of historic sites. These two pieces of legislation are described below:

**National Historic Preservation Act** - Section 106 of this act requires the Department of Transportation to identify historic properties listed in the National Register of Historic Places and properties eligible to be listed. The DOT must consider the impact of its road projects on these properties and consult with the Federal Advisory Council on Historic Preservation.

**NC General Statute 121-12(a)** - This statute requires the DOT to identify historic properties listed on the National Register, but not necessarily those eligible to be listed. DOT must consider impacts and consult with the North Carolina Historical Commission, but is not bound by their recommendations.

Historic sites were investigated using data from a GIS (Geographic Information System) database. Properties and districts listed on the National Register of Historic Places, as well as on its study list, were identified and avoided in all proposed road construction projects. However, additional sites may be nominated for the National Register before construction commences on a given project; therefore, a more exhaustive historical survey should be conducted prior to the construction of any project.

# Northern Currituck County Environmental Data

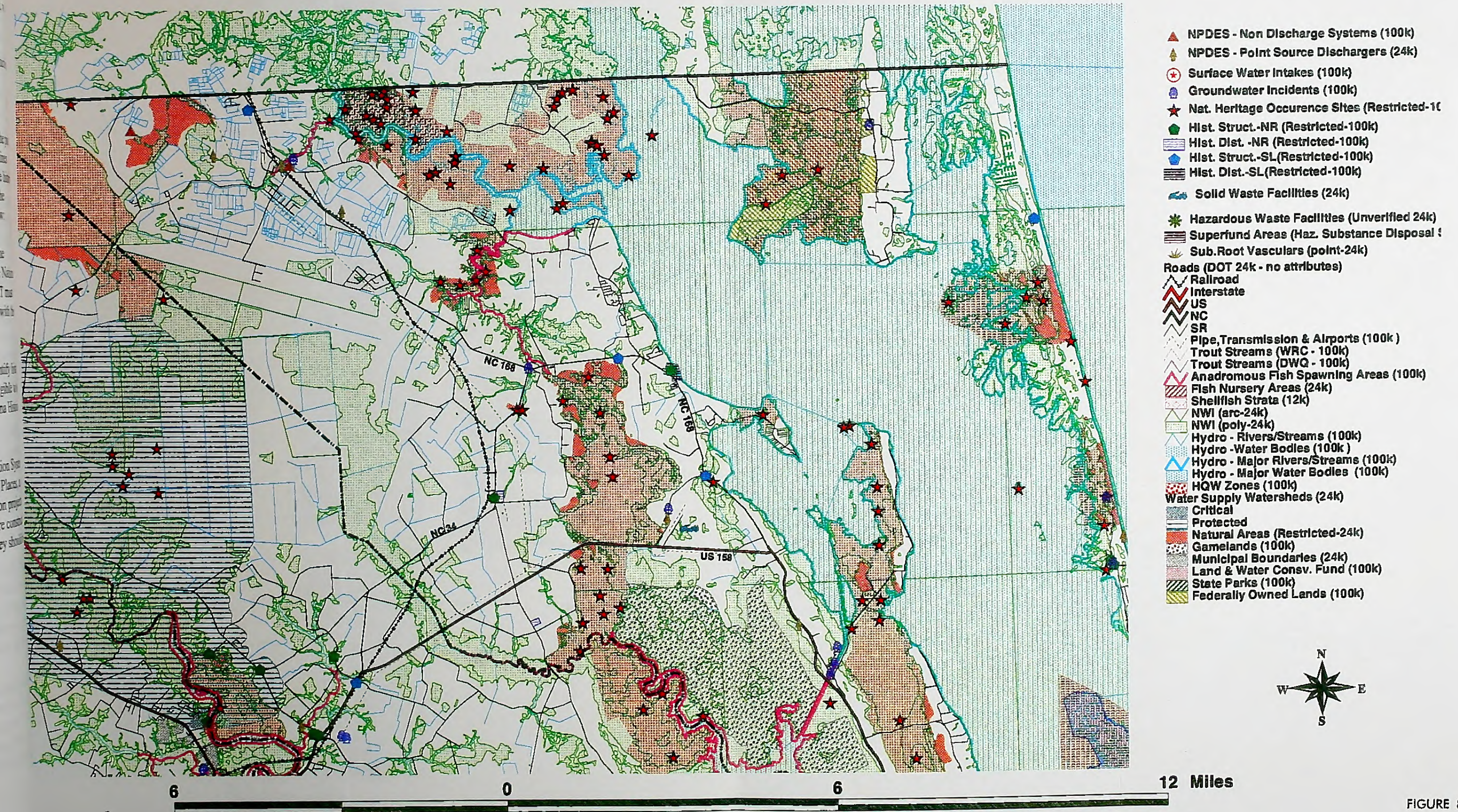
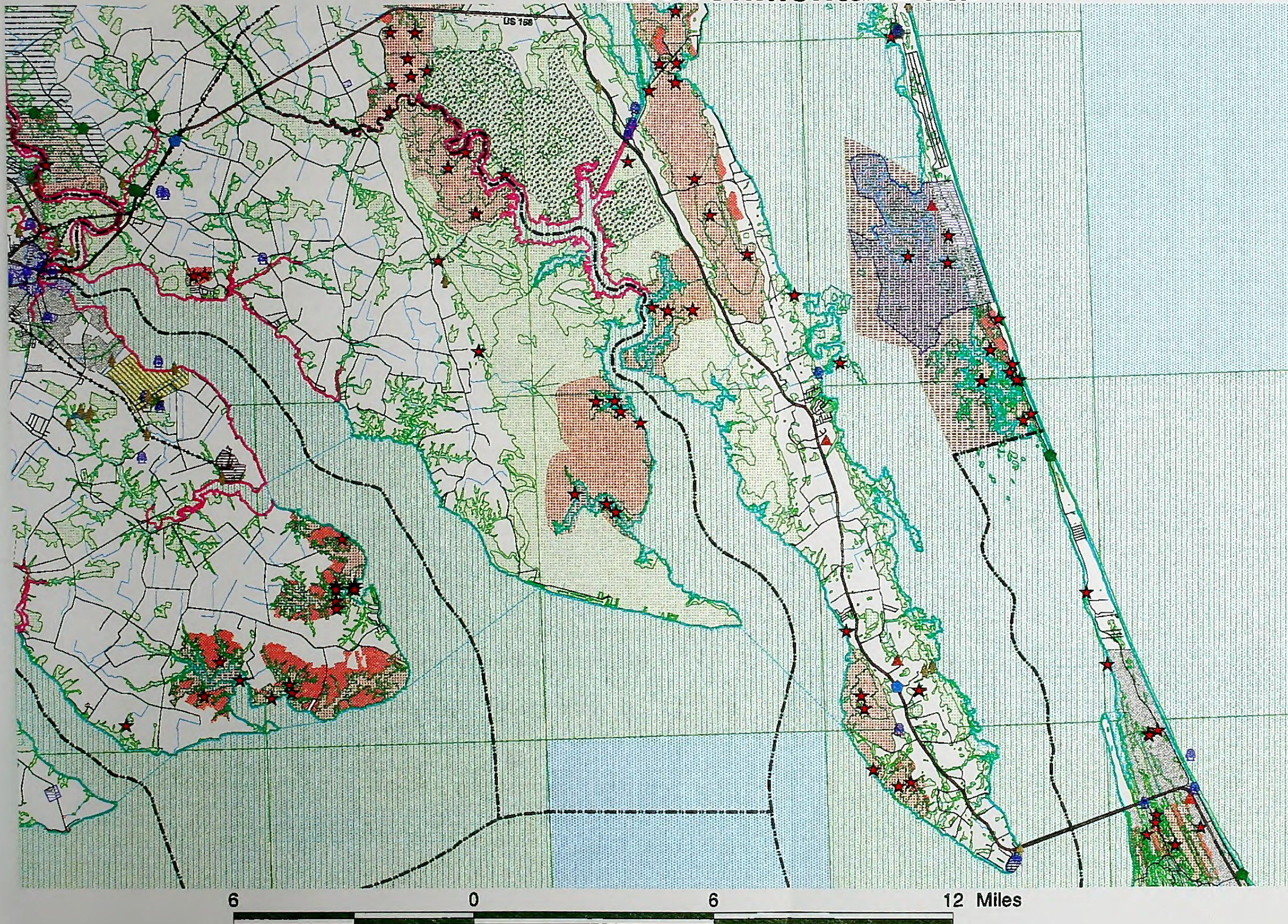


FIGURE 8



# Southern Currituck County Environmental Data



- ▲ NPDES - Non Discharge Systems (100k)
- ▲ NPDES - Point Source Dischargers (24k)
- ★ Surface Water Intakes (100k)
- Groundwater Incidents (100k)
- ★ Nat. Heritage Occurrence Sites (Restricted-1)
- Hist. Struct.-NR (Restricted-100k)
- Hist. Dist.-NR (Restricted-100k)
- Hist. Struct.-SL(Restricted-100k)
- Hist. Dist.-SL(Restricted-100k)
- Solid Waste Facilities (24k)
- Hazardous Waste Facilities (Unverified 24k)
- Superfund Areas (Haz. Substance Disposal)
- Sub.Root Vasculars (point-24k)
- Roads (DOT 24k - no attributes)
- ▲ Railroad
- ▲ Interstate
- ▲ US
- ▲ NC
- ▲ SR
- ▲ Pipe,Transmission & Airports (100k)
- ▲ Trout Streams (WRC - 100k)
- ▲ Trout Streams (DWQ - 100k)
- ▲ Anadromous Fish Spawning Areas (100k)
- ▲ Fish Nursery Areas (24k)
- ▲ Shellfish Strata (12k)
- ▲ NWI (arc-24k)
- ▲ NWI (poly-24k)
- ▲ Hydro - Rivers/Streams (100k)
- ▲ Hydro - Water Bodies (100k)
- ▲ Hydro - Major Rivers/Streams (100k)
- ▲ Hydro - Major Water Bodies (100k)
- ▲ HQW Zones (100k)
- ▲ Water Supply Watersheds (24k)
- ▲ Critical
- ▲ Protected
- ▲ Natural Areas (Restricted-24k)
- ▲ Game Lands (100k)
- ▲ Municipal Boundaries (24k)
- ▲ Land & Water Conserv. Fund (100k)
- ▲ State Parks (100k)
- ▲ Federally Owned Lands (100k)

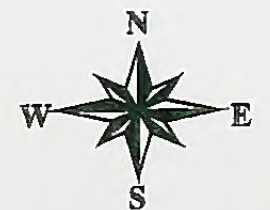


FIGURE 8



# **Appendix A**

## **Thoroughfare Plan Street Tabulation and Recommendations**

This appendix includes a detailed tabulation of all roads identified as elements of the Currituck County Thoroughfare Plan. Table A-1 includes a description of each road section, as well as the length, cross-section, and right-of-way for each section. Also included are existing and projected average summer weekday traffic volumes, roadway capacity, and the recommended ultimate lane configuration.

### **Typical Cross Sections**

Cross section requirements for thoroughfares vary according to the desired capacity and level of service to be provided. Universal standards in design of thoroughfares are not practical. Each section of road must be individually analyzed and its cross section requirements determined on the basis of amount and type of projected traffic, existing capacity, desired level of service, and available right-of-way. Typical cross sections recommended by the Statewide Planning Branch are shown in Figure A-1. These cross sections are typical for facilities at new locations and where right-of-way constraints are not critical. For widening projects and urban projects with limited right-of-way, special cross-sections should be developed that meet the needs of the project.

The recommended typical cross sections shown in Table A-1 were derived on the basis of projected traffic, existing capacities, desirable levels of service, and available right-of-way.

On all existing and proposed major thoroughfares delineated on the thoroughfare plan, adequate right-of-way should be protected or acquired for the ultimate cross sections. Ultimate desirable cross sections for each of the thoroughfares are listed here. Recommendations for "ultimate" cross sections are provided for the following:

1. thoroughfares which may require widening after the current planning period;
2. thoroughfares which are borderline adequate, where accelerated traffic growth could render them deficient; and
3. thoroughfares where an urban curb and gutter cross section may be locally desirable because of urban development or redevelopment.

#### **A - Four Lanes Divided with Median, Freeway**

This cross section is typical for four-lane divided highways in rural areas which may have only partial or no control of access. The minimum median width for this cross section is 14 m (46 feet), but a wider median is desirable.

### ***B - Seven Lanes, Curb & Gutter***

This cross section is not recommended for new projects. When the conditions warrant six lanes, cross section "D" should be recommended. Cross section "B" should be used only in special situations such as widening from a five lane section when right-of-way is limited. Even in these situations, consideration should be given to converting the center turn lane to a median so that cross section "D" is the final cross section.

### ***C - Five Lanes, Curb & Gutter***

Typical for major thoroughfares, this cross section is desirable where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

### ***D - Six Lanes Divided with Raised Median, Curb & Gutter***

### ***E - Four Lanes Divided with Raised Median, Curb & Gutter***

These cross sections are typically used on major thoroughfares where left turns and intersection streets are not as frequent. Left turns would be restricted to a few selected intersections. The 4.8 m (16 ft) median is the minimum recommended for an urban boulevard type cross section. In most instances, monolithic construction should be utilized due to greater cost effectiveness, ease and speed of placement, and reduced future maintenance requirements. In special cases, grassed or landscaped medians may be used in urban areas. However, these types of medians result in greatly increased maintenance costs and an increased danger to maintenance personnel. Non-monolithic medians should only be recommended when the above concerns are addressed.

### ***F - Four Lanes Divided, Boulevard, Grass Median***

Recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 7.3 m (24 ft) is recommended with 9.1 m (30 ft) being desirable.

### ***G - Four Lanes, Curb & Gutter***

This cross section is recommended for major thoroughfares where projected travel indicates a need for four travel lanes but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane would probably be required at major intersections. This cross section should be used only if the above criteria is met. If right-of-way is not restricted, future strip development could take place and the inner lanes could become de facto left turn lanes.

### ***H - Three Lanes, Curb & Gutter***

In urban environments, thoroughfares which are proposed to function as one-way traffic carriers would typically require this cross section.

### ***I - Two Lanes, Curb & Gutter with Parking on Both Sides***

### ***J - Two Lanes, Curb & Gutter with Parking on One Side***

Cross sections "I" and "J" are usually recommended for urban minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross section

"I" would be used on those minor thoroughfares where parking on both sides is needed as a result of more intense development.

### ***K - Two Lanes, Paved Shoulder***

This cross section is used in rural areas or for staged construction of a wider multi-lane cross section. On some thoroughfares, projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time. For areas that are growing and future widening will be necessary, the full right-of-way of 30 m (100 ft) should be required. In some instances, local ordinances may not allow the full 30 m. In those cases, 21 m (70 ft) should be preserved with the understanding that the full 30 m will be reserved by use of building setbacks and future street line ordinances.

### ***L - Six Lanes Divided with Grass Median, Freeway***

Cross section "L" is typical for controlled access freeways. The 14 m (46 ft) grassed median is the minimum desirable median width, but there could be some variation from this depending upon design considerations. Right-of-way requirements would typically vary upward from 70 m (228 ft) depending upon cut and fill requirements.

### ***M - Eight Lanes Divided with Raised Median, Curb & Gutter***

Also used for controlled access freeways, this cross section may be recommended for freeways going through major urban areas or for routes projected to carry very high volumes of traffic.

### ***N - Five Lanes, Curb & Gutter, Widened Curb Lanes***

### ***O - Two Lanes, Shoulder Section***

### ***P - Four Lanes Divided with Raised Median, Curb & Gutter, Widened Curb Lanes***

If there is sufficient bicycle travel along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to contain the bicycle facilities. The North Carolina Bicycle Facilities Planning and Design Guidelines should be consulted for design standards for bicycle facilities.

### ***Other General Information***

The urban curb & gutter cross sections illustrate the sidewalk adjacent to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If the sidewalk is moved farther away from the street to provide additional separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

The rights-of-way shown for the typical cross sections are the minimum required to contain the street, sidewalks, utilities, and drainage facilities. Additional cut and fill may require either additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban thoroughfare construction.

The following index of abbreviations may be helpful in interpreting the table:

- A through P – Codes referring to the Typical Cross Sections
- ASWT – Average Summer Weekday Traffic
- ADQ – Adequate
- Brg – bridge
- Co – County
- code – Refers to Typical Cross Sections
- ft – feet
- km – Kilometers
- lanes – Number of lanes
- #L – Number of Lanes
- #LD – Number of Lanes Divided (i.e., a road with a median)
- m – Meters
- N, S, E, or W – North, South, East, or West
- N/A or --- – Not available
- PAVE – paving recommended for road
- Practical Capacity – the capacity of the road at Level-of-Service D (see Appendix E), or the point at which the public begins to express dissatisfaction with the road's service
- Prop'd – Proposed
- Rec – Recommended
- ROW – Right-of-way
- SR – Secondary Road
- UN – unpaved
- vpd – Vehicles per Day

## TYPICAL THOROUGHFARE CROSS SECTIONS

Diagram illustrating the cross-section of a four-lane divided freeway with a median. The total width is 228' (70m). The median width is 14m (46' MINIMUM). The lane widths are 12m (3.6m). The shoulder widths are 4' - 10' P.S. (1.2m - 3m) on the outside and 6' (1.8m) on the inside. The diagram is labeled "FOUR LANES DIVIDED WITH MEDIAN - FREEWAY".

33m  
110'

UTILITY

1.5m

2.5

3.3m - 3.6m

11' - 12'

3.3m - 3.6m

11' - 12'

3.3m - 3.6m

11' - 12'

3.3m - 3.6m

11' - 12'

3.3m - 3.6m

11' - 12'

3.3m - 3.6m

11' - 12'

2.5

1.5m

S.W.

S.W.

UTILITY

SEVEN LANES - CURB & GUTTER

27m  
90'

0.75m  
2.5'

3.3m - 3.6m  
11' - 12'

3.3m - 3.6m  
11' - 12'

3.3m - 3.6m  
11' - 12'

3.3m - 3.6m  
11' - 12'

3.3m - 3.6m  
11' - 12'

0.75m  
2.5'

1.5m  
5'

UTILITY S.W.

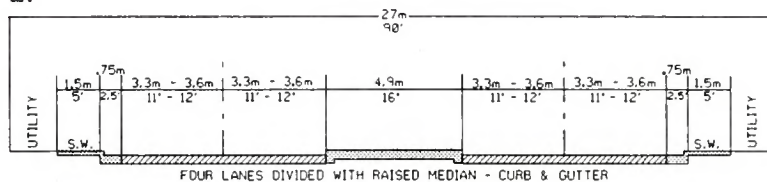
UTILITY S.W.

FIVE LANES - CURB & GUTTER

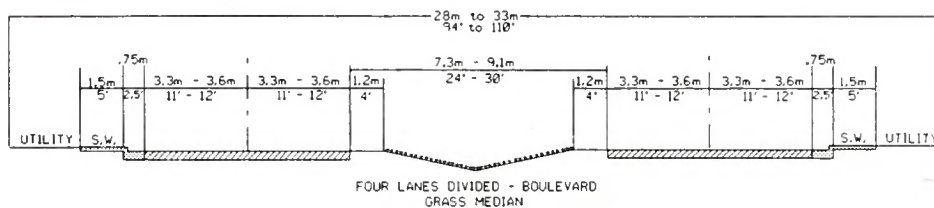
Plan view of the proposed six-lane highway. The total width is 33m (110'). The layout includes a 1.5m utility area on the left, followed by a 2.5m section. The main travel lanes consist of three 3.3m wide lanes on each side of a central 4.9m wide raised median. The right side ends with a 2.5m section and a 1.5m utility area. The text below the diagram reads: "SIX LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER".

# TYPICAL THOROUGHFARE CROSS SECTIONS

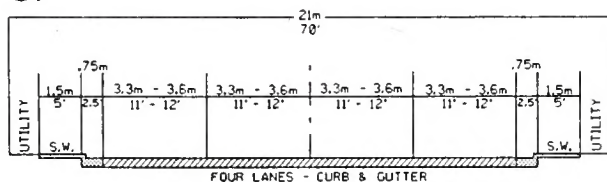
E.



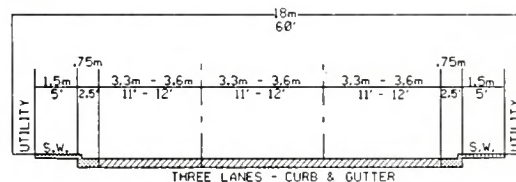
F.



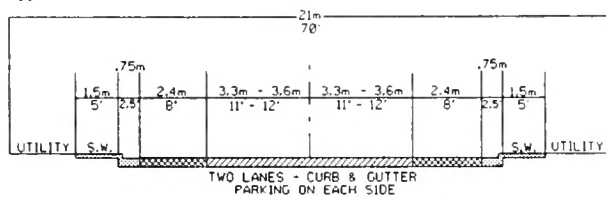
G.



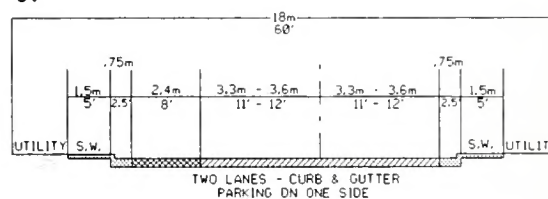
H.



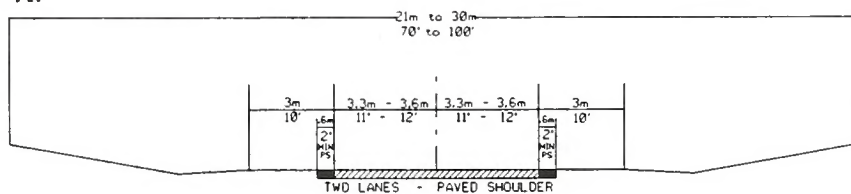
I.



J.

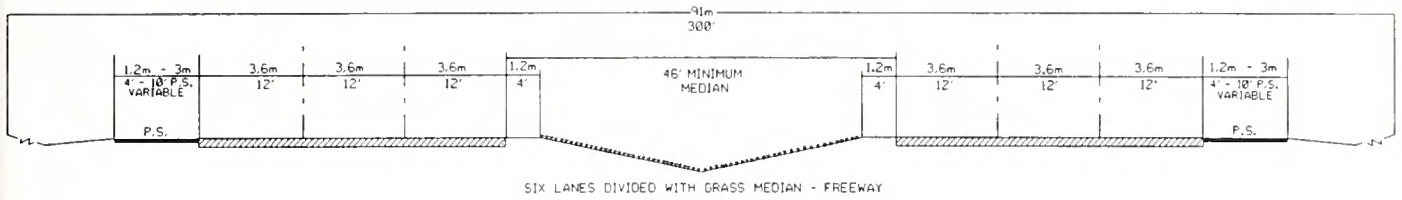


K.

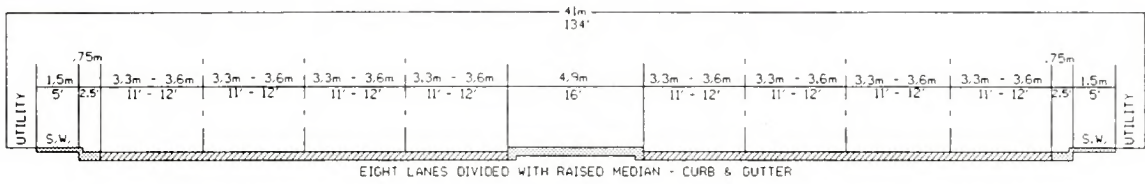


# TYPICAL THOROUGHFARE CROSS SECTIONS

L.

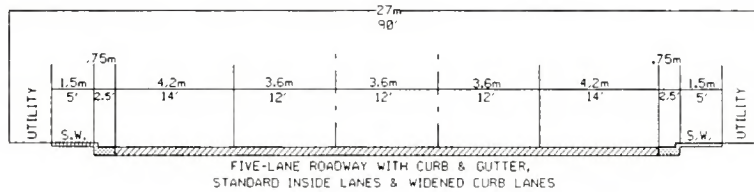


M.

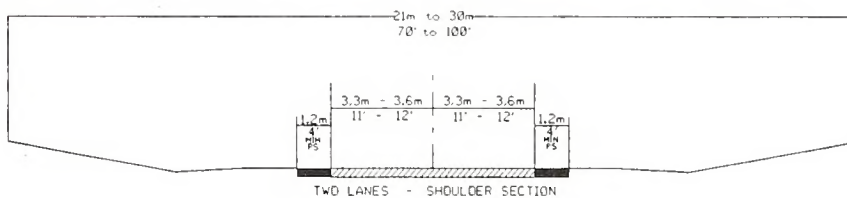


## TYPICAL THOROUGHFARE CROSS SECTIONS FOR ACCOMMODATING BICYCLES

N.



O.



P.

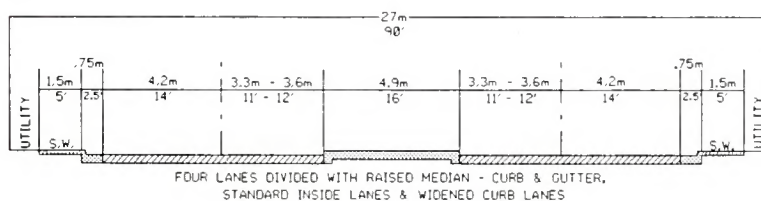




Table A-1

CURRITUCK COUNTY STREET INVENTORY AND RECOMMENDATIONS	♦ ♦ ♦ ♦ EXISTING ROAD SYSTEM ♦ ♦ ♦ ♦				AVG SUMMER WEEKDAY TRAFFIC		♦ ♦ ♦ ♦ PROPOSED PLAN ♦ ♦ ♦ ♦		
	DISTANCE mi	CROSS SECTION ROADWAY ft / lanes	ROW ft	PRACTICAL CAPACITY vpd	1995 vpd	2025 vpd	CROSS SECTION ROADWAY code/lanes	ROW ft	ASWT 2025 vpd
<b>US 158</b>									
Camden Co Line - Prop'd NC 168 Bypass	3.90	20 / 2L	100	9,000	6,300	20,300	F / 4LD	110	20,300
Proposed NC 168 Bypass - SR 1247	1.61	20 / 2L	100	9,000	---	---	F / 4LD	110	---
SR 1247 - 0.09 mi W of NC 168	2.81	20 / 2L	100	9,000	6,600	21,400	F / 4LD	110	31,400
0.09 mi W of NC 168 - NC 168	0.09	24 / 2L	100	11,000	6,600	21,400	F / 4LD	110	31,400
NC 168 - 0.16 mi S	0.16	34 / 5L	100	25,000	---	---	D / 6LD	110	---
0.16 mi S of NC 168 - SR 1143	2.38	64 / 5L	80	25,000	16,400	53,100	D / 6LD	110	53,100
SR 1143 - Creek	1.86	48 / 4L	150	30,000	---	---	D / 6LD	110	---
Creek - Proposed Mid-Currituck Bridge	0.33	60 / 5L	120	25,000	14,900	48,300	D / 6LD	110	48,300
Mid-Currituck Bridge - SR 1140	0.50	60 / 5L	120	25,000	---	---	D / 6LD	110	---
SR 1140 - NC 3	3.60	60 / 5L	120	25,000	---	---	D / 6LD	110	---
NC 3 - 0.34 mi N of SR 1125	2.21	60 / 5L	120	25,000	16,900	54,800	D / 6LD	110	33,000
0.34 mi N of SR 1125 to 1.86 mi S	1.86	64 / 5L	100	25,000	---	---	D / 6LD	110	---
1.52 mi S of SR 1125 - SR 1118 South End	5.02	60 / 5L	100	25,000	13,600	47,500	D / 6LD	110	29,500
SR 1118 South End - SR 1102	6.00	60 / 5L	100	25,000	17,100	55,500	D / 6LD	110	34,500
SR 1102 - SR 1187	0.61	60 / 5L	180	25,000	---	---	D / 6LD	110	---
SR 1187 - Bridge	0.19	60 / 5L	150	25,000	---	---	D / 6LD	110	---
Currituck Sound Bridge (Wright Memorial)	1.35	64 / 4LD	N/A	40,000	16,900	54,800	D / 6LD	110	34,100
<b>NC 3</b>									
US 158 - SR 1135	1.56	2 / 2L	60	9,000	500	1100	ADQ	ADQ	1100
SR 1135 - Currituck Sound	0.65	20 / 2L	60	9,000	300	700	ADQ	ADQ	700
<b>NC 12</b>									
North End State Maint. - 0.8 mi S	0.80	26 / 2L	60	12,000	2,400	8,400	E / 4LD	90	8,400
0.8 mi S of State Maint. - SR 1409	0.20	20 / 2L	60	9,000	---	---	E / 4LD	90	---
SR 1409 - SR 1402	3.14	20 / 2L	100	9,000	---	---	E / 4LD	90	---
SR 1402 - 0.23 mi S	0.23	20 / 2L	60	9,000	---	---	E / 4LD	90	---
0.23 mi S of SR 1402 - 3.53 mi S SR 1402	3.30	26 / 2L	60	12,000	---	---	E / 4LD	90	---
3.53 mi S SR 1402 - 3.0 mi N Dare Co Line	0.50	20 / 2L	60	9,000	---	---	E / 4LD	90	---
3.0 mi N of Dare Co Line - 0.5 mi N of Dare	2.50	26 / 2L	60	12,000	---	---	E / 4LD	90	---
0.5 mi N of Dare Co Line - Dare Co Line	0.50	20 / 2L	60	9,000	N/A	34,800	E / 4LD	90	28,000
<b>NC 34</b>									
Camden Co Line - SR 1207	3.20	22 / 2L	100	10,000	3,000	7,200	ADQ	ADQ	7,200
SR 1207 - NC 168	3.16	22 / 2L	100	10,000	3,300	8,000	ADQ	ADQ	7,400

Table A-1

CURRITUCK COUNTY STREET INVENTORY AND RECOMMENDATIONS	♦ ♦ ♦ ♦ EXISTING ROAD SYSTEM ♦ ♦ ♦ ♦				♦ ♦ ♦ ♦ PROPOSED PLAN ♦ ♦ ♦ ♦	
	♦ ♦ ♦ ♦ DISTANCE mi	♦ ♦ ♦ ♦ CROSS SECTION ROADWAY ft / lanes	♦ ♦ ♦ ♦ ROW ft	♦ ♦ ♦ ♦ PRACTICAL CAPACITY vpd	♦ ♦ ♦ ♦ CROSS SECTION ROADWAY code/lanes	♦ ♦ ♦ ♦ ROW ft
♦ ♦ ♦ ♦ WEEKDAY TRAFFIC 1995 vpd						
♦ ♦ ♦ ♦ 2025 vpd						
♦ ♦ ♦ ♦ ASWT 2025 vpd						
<b>NC 168</b>						
US 158 - 0.12 mi N	0.12	64 / 5L	100	25,000	ADQ	ADQ
0.12 mi N of US 158 - SR 1246	2.38	24 / 2L	100	11,000	C / 5L	90
SR 1246 - SR 1222	3.40	24 / 2L	100	11,000	C / 5L	90
SR 1222 - NC 34	2.60	24 / 2L	100	11,000	C / 5L	90
NC 34 - SR 1202	1.80	24 / 2L	100	11,000	C / 5L	90
SR 1202 - SR 1221	4.60	24 / 2L	100	11,000	C / 5L	90
SR 1221 - SR 1229/Prop'd NC 168 Bypass	2.56	24 / 2L	100	11,000	C / 5L	90
SR 1229/Prop'd Bypass - Virginia State Line	0.87	24 / 2L	100	11,000	A / 4LD	228
<b>NC 168 Bypass</b>						
NC 168 N of Moyock - US 158	♦ ♦ ♦ ♦	♦ ♦ ♦ ♦	♦ ♦ ♦ ♦ Proposed Bypass Facility	♦ ♦ ♦ ♦	A / 4LD	228
<b>NC 615</b>						
Ferry Landing - SR 1260	0.31	20 / 2L	60	9,000	K / 2L	ADQ
SR 1260 - SR 1265	1.73	16 / 2L	60	7,000	K / 2L	ADQ
SR 1265 - Virginia State Line	7.22	18 / 2L	60	8,000	K / 2L	ADQ
<b>Mia-Currituck Bridge</b>						
US 158 - NC 12	♦ ♦ ♦ ♦	♦ ♦ ♦ ♦	♦ ♦ ♦ ♦ Proposed Bridge	♦ ♦ ♦ ♦	Brg / 4LD	N/A
<b>SR 1101, Griggs Acres Road</b>						
US 158 - SR 1163	0.50	18 / 2L	60	8,000	ADQ	ADQ
<b>SR 1103, Harbinger Ridge Road</b>						
SR 1109 - SR 1104	1.00	20 / 2L	60	9,000	ADQ	ADQ
SR 1104 - 0.3 mi S	0.30	16 / 2UN	60	2,500	K / 2L	ADQ
0.3 mi S of SR 1104 - SR 1163	♦ ♦ ♦ ♦	♦ ♦ ♦ ♦	♦ ♦ ♦ ♦ Proposed Connector Road	♦ ♦ ♦ ♦	K / 2L	60
<b>SR 1109, West Mobile Road</b>						
US 158 - SR 1103	0.60	20 / 2L	60	9,000	ADQ	ADQ
<b>SR 1111, Hog Quarter Road</b>						
US 158 - SR 1113	0.80	16 / 2L	60	7,000	K / 2L	ADQ

Table A-1

CURRITUCK COUNTY STREET INVENTORY AND RECOMMENDATIONS	◆ ◆ ◆ ◆ EXISTING ROAD SYSTEM ◆ ◆ ◆ ◆			PRACTICAL CAPACITY vpd	AVG SUMMER WEEKDAY TRAFFIC 1995 vpd		CROSS SECTION ROADWAY code/lanes	◆ ◆ ◆ ◆ PROPOSED PLAN ◆ ◆ ◆ ◆		
	DISTANCE mi	CROSS SECTION ROADWAY ft / lanes	ROW ft		CROSS SECTION ROADWAY code/lanes	ROW ft		PRACTICAL CAPACITY vpd	ASWT 2025 vpd	
SR 1113, North Spot Road  US 158 - SR 1111	1.60	20 / 2L	N/A	9,000	600	1,300	ADQ	ADQ	ADQ	1,500
SR 1117, Owens Road  SR 1118 - End of Road End of Road - SR 1113	0.20	12/ 2UN	60	2,500	---	---	K / 2L	ADQ	11,000	---
	◆ ☆ ☆	◆ ☆ ☆	◆ ☆ ☆ Proposed Connector Road	◆ ☆ ☆	◆ ☆ ☆	◆ ☆ ☆	K / 2L	60	11,000	---
SR 1118, Forbes Road  US 158 - 1.80 mi N 1.8 mi N of US 158 - Unpaved Section Start of Unpaved Section - 0.1 mi N 0.1 mi N of Pavement - 0.04 mi E of US 158 0.04 mi E of US 158 - US 158	1.80	18 / 2L	60	8,000	400	900	ADQ	ADQ	ADQ	1,200
	1.20	20 / 2L	60	9,000	150	600	ADQ	ADQ	ADQ	800
	0.10	16 / 2UN	60	7,000	---	---	PAVE	ADQ	ADQ	---
	1.36	32 / 2UN	60	12,000	---	---	PAVE	ADQ	ADQ	---
	0.04	30 / 2L	60	12,000	---	---	ADQ	ADQ	ADQ	---
SR 1124, Fisher Landing Road  SR 1125 - 0.2 mi E 0.2 mi E of SR 1125 - US 158 at SR 1118	0.20	16 / 2L	N/A	7,000	250	700	K / 2L	60	11,000	1,000
	◆ ☆ ☆	◆ ☆ ☆	◆ ☆ ☆ Proposed Connector Road	◆ ☆ ☆	◆ ☆ ☆	◆ ☆ ☆	K / 2L	60	11,000	1,000
SR 1125, Grandy Road  SR 1124 - 3.2 mi N 3.2 mi N of SR 1124 - US 158 at SR 1131	3.20	20 / 2L	N/A	9,000	---	---	ADQ	ADQ	ADQ	---
	◆ ☆ ☆	◆ ☆ ☆	◆ ☆ ☆ Proposed Connector Road	◆ ☆ ☆	◆ ☆ ☆	◆ ☆ ☆	K / 2L	60	11,000	---
SR 1131, Poplar Branch Road  US 158 - SR 1175 US 158 - NC 3	0.35	18 / 2L	60	8,000	2,700	5,900	K / 2L	ADQ	11,000	6,200
	2.12	18 / 2L	60	8,000	1,400	2,700	K / 2L	ADQ	11,000	2,900
SR 1132, Barnard Road  US 158 - SR 1131	0.50	18 / 2L	N/A	8,000	600	1,300	K / 2L	60	11,000	1,300
SR 1135, Aydlott Road  NC 3 - SR 1137	0.65	18 / 2L	N/A	8,000	900	1,700	ADQ	ADQ	ADQ	1,700
SR 1137, Narrow Shore Road  SR 1135 - SR 1139 SR 1139 - SR 1140	2.47	18 / 2L	N/A	8,000	1,200	2,500	ADQ	ADQ	ADQ	2,700
	0.14	16 / 2L	N/A	7,000	---	---	ADQ	ADQ	ADQ	---

Table A-1

CURRITUCK COUNTY STREET INVENTORY AND RECOMMENDATIONS	♦ ♦ ♦ ♦ EXISTING ROAD SYSTEM ♦ ♦ ♦ ♦		♦ ♦ ♦ ♦ PROPOSED PLAN ♦ ♦ ♦ ♦							
	DISTANCE mi	CROSS SECTION ROADWAY ft / lanes	ROW ft	PRACTICAL CAPACITY vpd	AVG SUMMER WEEKDAY TRAFFIC 1995 vpd	2025 vpd	CROSS SECTION ROADWAY code/lanes	ROW ft	PRACTICAL CAPACITY vpd	ASWT 2025 vpd
SR 1139, Laurel Swamp Road SR 1137 - SR 1140	0.29	18 / 2L	N/A	8,000	900	1,600	K / 2L	60	11,000	1,800
	1.90	18 / 2L	N/A	8,000	1,100	2,300	ADQ	ADQ	ADQ	2,300
SR 1140, Aydlott Road US 158 - SR 1137	0.20	18 / 2L	N/A	8,000	1,300	2,300	ADQ	ADQ	ADQ	2,300
	0.95	20 / 2L	80	9,000	1,000	1,900	K / 2L	ADQ	11,000	1,900
SR 1142, Waterlilly Road SR 1141 - 0.95 mi N 0.95 mi N of SR 1141 - Waterlilly Waterlilly - 0.3 mi N 0.3 mi N of Waterlilly - Currituck Sound	2.15	18 / 2L	N/A	8,000	---	---	K / 2L	60	11,000	---
	0.30	18 / 2L	N/A	8,000	700	1,300	K / 2L	60	11,000	1,300
	2.90	16 / 2L	N/A	7,000	---	---	K / 2L	60	11,000	---
	1.80	18 / 2L	N/A	8,000	1,200	2,100	K / 2L	60	11,000	2,100
SR 1147, North Indian Town Road NC 34 - US 158 US 158 - Camden Co. Line	2.40	18 / 2L	N/A	8,000	1,100	2,000	K / 2L	60	11,000	2,000
	0.30	20 / 2L	60	9,000	---	---	ADQ	ADQ	ADQ	---
SR 1163, Grigg's Acres Drive SR 1101 - End of Road	0.15	18 / 2L	N/A	8,000	450	900	K / 2L	60	11,000	1,300
	1.95	16 / 2L	N/A	8,000	1,600	2,800	K / 2L	60	11,000	3,300
	0.40	12 / 2UN	N/A	2,500	---	---	PAVE	60	8,000	---
	1.00	20 / 2L	N/A	9,000	1,400	2,800	K / 2L	60	11,000	2,800
SR 1218, Northwest Backwoods Road Camden Co. Line - SR 1227 SR 1227 - Virginia State Line	3.60	20 / 2L	N/A	9,000	1,200	2,400	K / 2L	60	11,000	2,400
	2.81	18 / 2L	N/A	8,000	1,700	4,200	K / 2L	60	11,000	4,200
SR 1222, Tuli's Creek Road NC 168 - SR 1239 SR 1239 - SR 1221 SR 1221 - SR 1228	7.63	18 / 2L	N/A	8,000	2,700	6,300	K / 2L	60	11,000	6,300
	0.58	18 / 2L	N/A	8,000	3,500	7,900	K / 2L	60	11,000	7,900

Table A-1

CURRITUCK COUNTY STREET INVENTORY AND RECOMMENDATIONS	♦ ♦ ♦ ♦ EXISTING ROAD SYSTEM		♦ ♦ ♦ ♦ PRACTICAL CAPACITY		AVG SUMMER WEEKDAY TRAFFIC		♦ ♦ ♦ ♦ PROPOSED PLAN		♦ ♦ ♦ ♦ ASWT	
	DISTANCE mi	CROSS SECTION ROADWAY ft / lanes	ROW ft	PRACTICAL CAPACITY vpd	1995 vpd	2025 vpd	CROSS SECTION ROADWAY code/lanes	ROW ft	PRACTICAL CAPACITY vpd	ASWT vpd
SR 1227, South Mills Road NC 168 - 2.09 mi W 2.09 mi W of NC 168 - SR 1218	2.09	18 / 2L	N/A	8,000	1,100	2,300	K / 2L	60	11,000	2,700
	1.80	20 / 2L	N/A	9,000	1,000	2,100	K / 2L	60	11,000	2,400
SR 1228, Camellia Road SR 1227 - NC 168 NC 168 - SR 1222	0.40	18 / 2L	N/A	8,000	---	---	K / 2L	60	11,000	---
	0.09	18 / 2L	N/A	8,000	900	1,700	K / 2L	60	11,000	1,700
SR 1232, Poyner's Road NC 168 - SR 1222	2.90	16 / 2L	N/A	7,000	700	1,500	K / 2L	60	11,000	1,500
SR 1242 NC 168 - Ferry Landing Ferry Landing - NC 168	0.32	22 / 2L	60	10,000	1,600	3,000	ADQ	ADQ	ADQ	3,000
	0.28	22 / 2L	60	10,000	1,100	2,100	ADQ	ADQ	ADQ	2,100
SR 1243, Bell's Island Road NC 168 - 2.9 mi E 2.9 mi E of NC 168 - End of Road	2.90	20 / 2L	N/A	9,000	1,100	2,200	K / 2L	60	11,000	2,200
	0.70	20 / 2L	60	9,000	---	---	K / 2L	ADQ	11,000	---
SR 1246, Maple Road US 158 - 0.7 mi NE 0.7 mi NE of US 158 - NC 168	0.70	20 / 2L	N/A	9,000	1,500	3,000	K / 2L	60	11,000	2,700
	1.60	18 / 2L	N/A	8,000	1,300	2,800	K / 2L	60	11,000	2,500
SR 1253, Knott's Island Road NC 615 - Virginia State Line	1.00	16 / 2L	N/A	7,000	800	1,400	K / 2L	60	11,000	1,400
SR 1256, Old Road NC 615 - NC 615	1.90	16 / 2L	N/A	7,000	600	1,100	K / 2L	60	11,000	1,100
SR 1259, Brumley Road NC 615 - End of Road	0.90	16 / 2L	N/A	7,000	800	1,500	K / 2L	60	11,000	1,500
SR 1405 US 158 - 0.17 mi N 0.17 mi N of US 158 - SR 1141	0.17	24 / 2L	100	11,000	---	---	ADQ	ADQ	ADQ	---
	0.27	24 / 2L	80	11,000	---	---	ADQ	ADQ	ADQ	---



## **Appendix B**

### **Thoroughfare Planning Principles**

There are many advantages to thoroughfare planning, but the primary mission is to assure that the road system will be progressively developed to serve future travel desires. Thus, the main consideration in thoroughfare planning is to make provisions for street and highway improvements so that, when the need arises, feasible opportunities to make improvements exist.

#### **Benefits of Thoroughfare Planning**

There are two major benefits derived from thoroughfare planning. First, each road or highway can be designed to perform a specific function and provide a specific level of service. This permits savings in right-of-way, construction, and maintenance costs. It also protects residential neighborhoods and encourages stability in travel and land use patterns. Second, local officials are informed of future improvements and can incorporate them into planning and policy decisions. This will permit developers to design subdivisions in a non-conflicting manner, direct school and park officials to better locate their facilities, and minimize the damage to property values and community appearance that is sometimes associated with roadway improvements.

#### **County Thoroughfare Planning Concepts**

The underlying concept of the thoroughfare plan is to provide a functional system of streets, roads, and highways that permit direct, efficient, and safe travel. Different elements in the system are designed to have specific functions and levels of service, thus minimizing the traffic and land service conflict.

In the county plan, elements are either urban or rural. In the urban planning area, the local municipality generally has planning jurisdiction. Outside the urban planning area, the county has planning jurisdiction. In those areas where no urban thoroughfare plan exists, elements are rural and are under the planning jurisdiction of the county.

Within the urban and rural systems, plan elements are classified according to the specific function they are to perform. A discussion of the elements and functions of the two systems follows.

#### **Rural Thoroughfare Classification System**

Streets perform two primary functions, traffic service and land access. When combined, these two functions are basically incompatible. The conflict is not serious if both traffic demands and land service demands are low. However, when traffic volumes are high, conflicts created by uncontrolled and intensely developed abutting property lead to intolerable traffic flow friction and congestion.

The thoroughfare plan provides a functional system of streets that permit travel from origins to destinations with directness, ease, and safety. Different streets in this system are designed to perform specific functions, thus minimizing the traffic and land service conflict.

In county thoroughfare planning, there are four major systems: principal arterials, minor arterials, major and minor collectors, and local roads.

### ***Principal Arterial System***

This system is a connected network of continuous routes that serve corridor movements having substantial statewide or interstate travel characteristics. This is shown by both the trip lengths and the travel densities. The principal arterial system serves all urban areas of over 50,000 population and most of those with a population greater than 5,000. The Interstate system constitutes a significant portion of the principal arterial system.

### ***Minor Arterial System***

This system forms a network that links cities, larger towns, and other major traffic generators such as large resorts. The minor arterial system generally serves intrastate and intercounty travel and travel corridors with trip lengths and travel densities somewhat less than the principal arterial system.

### ***Collector Road System***

The rural collector routes generally serve intracounty travel. These routes serve travel with distances that are shorter than on the arterial routes. The rural collector road system is subclassified into major and minor collector roads.

**Major Collector Roads:** These routes provide service to the larger towns not directly served by the higher systems and to other traffic generators of equivalent intracounty importance, such as consolidated schools, shipping points, county parks, significant mining and agricultural areas, etc. Major collector roads also link these places to routes of higher classification and serve the more important intracounty travel corridors.

**Minor Collector Roads:** These collect traffic from local roads and bring all developed areas within a reasonable distance of a major collector road. They also provide service to the remaining smaller communities and link the locally important traffic generators with the rural outskirts.

### ***Local Road System***

The local roads are all roads that are not on a higher system. Local residential subdivision streets and residential collector streets are elements of the local road system. Local residential streets include cul-de-sacs, loop streets less than 2,500 feet (760 m) in length, or streets less than one mile (1.6 km) in length. They do not connect thoroughfares or serve major traffic generators and typically do not collect traffic from

more than one hundred dwelling units. Residential collectors serve as the connecting street system between local residential streets and the thoroughfare system.

Figure B-1 provides a schematic illustration of a functionally classified rural highway system. The functional classification of roads in Currituck County is shown in Figure B-2.

## **Objectives of Thoroughfare Planning**

Thoroughfare planning is the process public officials use to assure the development of the most appropriate street system to meet the existing and future travel desires within the area. The primary aim of a thoroughfare plan is to guide the development of the road system in a manner consistent with changing traffic demands. Through proper planning for road development, costly errors and needless expense can be averted. A thoroughfare plan will enable road improvements to be made as traffic demand increases, and help eliminate unnecessary improvements. By developing the street system to keep pace with increasing traffic demands, maximum utilization of the system can be attained that will require a minimum amount of land for roads.

In addition to providing for traffic needs, the thoroughfare plan should embody those details of good urban planning necessary to present a pleasing and efficient urban community. The location of present and future population, commercial, and industrial enterprises affects major street and highway locations. Conversely, the location of major streets and highways within the urban area will influence the urban development pattern.

Other objectives of a thoroughfare plan include:

- providing for the development of an adequate major street system as land development occurs;
- reducing travel and transportation costs;
- reducing the cost of major street improvements to the public through the coordination of street systems with private actions;
- enabling private interests to plan their actions, improvements, and development with full knowledge of public intent;
- minimizing disruption and displacement of people and businesses through long range planning for major street improvements;
- reducing environmental impacts such as air pollution, resulting from transportation; and
- increasing travel safety.

These objectives are achieved through improving both the operational efficiency of thoroughfares, and improving the system efficiency by system coordination and layout.

## Operational Efficiency

A street's operational efficiency is improved by increasing the capability of the street to carry vehicular traffic and people. In terms of vehicular traffic, a street's capacity is the maximum number of vehicles that can pass a given point on a roadway during a given period under prevailing roadway and traffic conditions. Capacity is affected by the physical features of the roadway, nature of traffic, and weather.

Physical ways to improve vehicular capacity include:

- *Street widening* - Widening a street from two to four travel lanes, can more than double the capacity of the roadway because additional maneuverability for the traffic is provided.
- *Intersection improvements* - Increasing the turning radii, adding exclusive turn lanes, and channeling conflicting traffic movements can improve the capacity of an existing intersection.
- *Improvements to vertical and horizontal alignment* - These improvements can reduce the congestion caused by slow moving vehicles.
- *Elimination of roadside obstacles* - This can reduce side friction and improve a driver's field of sight.

Operational ways to improve street capacity include:

- *Control of access* - A roadway with complete access control can often carry three times the traffic handled by a non-controlled access street with identical lane width and number.
- *Parking relocation* - Relocating on-street parking to an off-street site increases capacity by providing additional street width for traffic flow and reducing the friction to traffic flow caused by parking and unparking vehicles
- *One-way operation* - The capacity of a street can sometimes be increased 20-50%, depending upon turning movements and street width, by initiating one-way traffic operations. One-way streets also can improve traffic flow by decreasing potential traffic conflicts and simplifying traffic signal coordination.
- *Reversible lanes* - Reversible traffic lanes may be used to increase street capacity in situations where heavy directional flows occur during peak periods or special events.
- *Signal phasing and coordination* - Uncoordinated signals and poor signal phasing restrict traffic flow by creating excessive stop-and-go operation.

Altering travel demand is a third way to improve the efficiency of existing streets. Travel demand can be reduced or altered in the following ways:

- *Carpools* - Encouraging people to form carpools and van pools for journeys to work and other trip purposes reduces the number of vehicles on the roadway and raises the people-carrying capability of the street system
- *Alternate modes* - Encouraging the use of alternate modes of travel such as transit, bicycles, or walking for short trips can reduce demand on the roadways.
- *Land use* - Plan and encourage land use development or redevelopment in a more travel efficient manner.

## **System Efficiency**

Another means of altering travel demand is the development of a more efficient system of streets that will better serve travel desires. A more efficient system can reduce travel distances, time, and cost. Improvements in system efficiency can be achieved through the concept of functional classification of streets and development of a coordinated major street system.

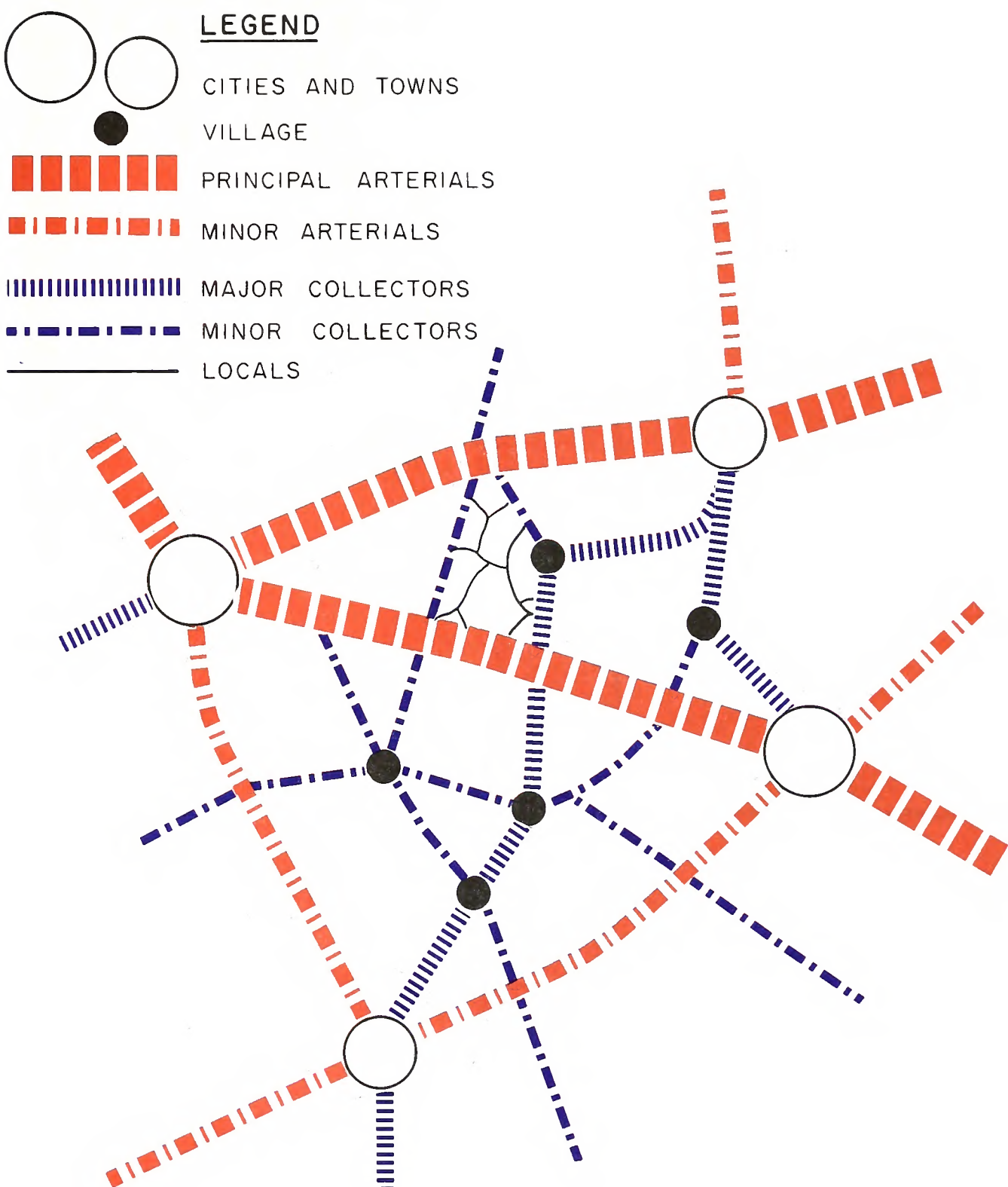
## **Application of Thoroughfare Planning Principles**

The concepts presented in the discussion of operational efficiency, system efficiency, functional classification, and idealized major thoroughfare system are the conceptual tools available to the transportation planner in developing a thoroughfare plan. In actual practice, thoroughfare planning is done for established areas and is constrained by existing land use and street patterns, existing public attitudes and goals, and current expectations of future land use. Compromises must be made because of these and the many other factors that affect major road locations.

Through the thoroughfare planning process, it is necessary from a practical viewpoint that certain basic principles be followed as closely as possible. These principles are listed below:

1. The plan should be derived from a thorough knowledge of today's travel - its component parts, and the factors that contribute to it, limit it, and modify it.
2. Traffic demands must be sufficient to warrant the designation and development of each major road. The thoroughfare plan should be designed to accommodate a large portion of major traffic movements on a few roads.
3. The plan should conform to and provide for the land development plan for the area.
4. Certain considerations must be given to development beyond the current planning period. Particularly in outlying or sparsely developed areas that have development potential, it is necessary to designate thoroughfares on a long-range planning basis to protect rights-of-way for future thoroughfare development.
5. While being consistent with the above principles and realistic in terms of travel trends, the plan must be economically feasible.





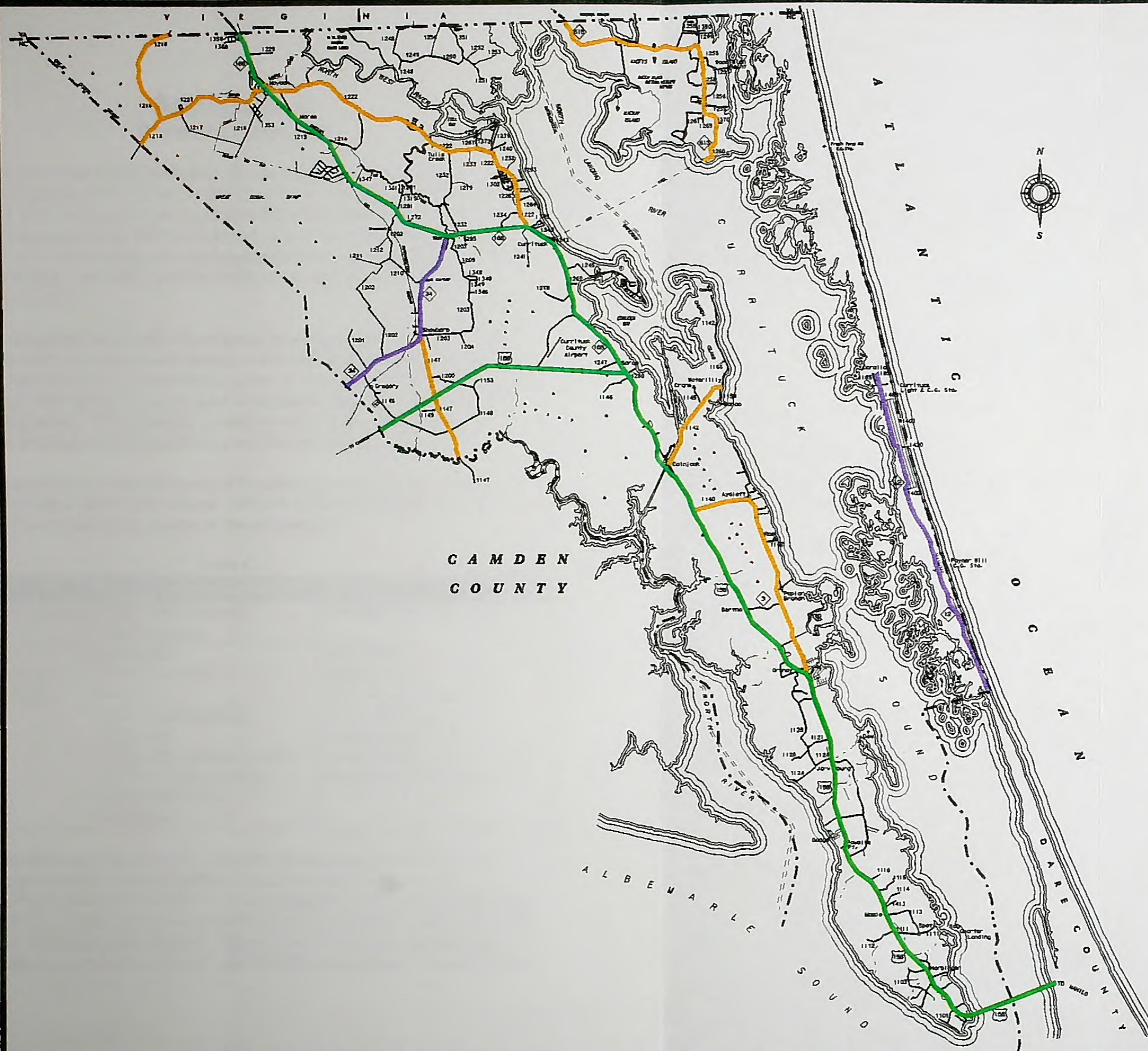
**FIGURE B-1**  
SCHEMATIC ILLUSTRATION  
OF FUNCTIONALLY CLASSIFIED  
RURAL HIGHWAY NETWORK



UNIVERSITY OF  
MICHIGAN LIBRARY

ANN ARBOR, MICHIGAN  
48106-1000

3 0100 0000 0000 0000  
0000 0000 0000 0000  
0000 0000 0000 0000  
0000 0000 0000 0000



# LEGEND

	Existing	Proposed
INTERSTATE	<span style="color: blue;">——</span>	<span style="color: blue;">- - - -</span>
OTHER PRINCIPAL ARTERIAL	<span style="color: red;">——</span>	<span style="color: red;">- - - -</span>
MINOR ARTERIAL	<span style="color: green;">——</span>	<span style="color: green;">- - - -</span>
MAJOR COLLECTOR	<span style="color: purple;">——</span>	<span style="color: purple;">- - - -</span>
MINOR COLLECTOR	<span style="color: orange;">——</span>	<span style="color: orange;">- - - -</span>

March 15, 1999

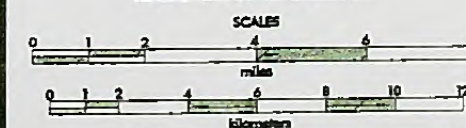
## FIGURE B-2 FUNCTIONAL CLASSIFICATION



### CURRITUCK COUNTY NORTH CAROLINA

PREPARED BY THE  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS - GIS UNIT

IN COOPERATION WITH THE  
U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION





## Appendix C

### Benefits Analysis

Reduced road user costs should result from any roadway improvement, from a simple widening to the construction of a new roadway to relieve congested or unsafe conditions. Comparisons of the existing and the proposed facilities have been made in terms of vehicle operating costs, travel time costs, and accident costs. These user benefits are computed as total dollar savings over the design period using data such as project length, base year and design year traffic volumes, traffic speed, type of facility, and volume/capacity ratio.

The impact of a project on economic development potential is shown as the probability that it will stimulate the economic development of an area by providing access to developable land and reducing transportation costs. It is a subjective estimate based on the knowledge of the proposed project, local development characteristics, and land development potential. The probability is rated on a scale from 0 (representing no development potential) to 1.00 (representing excellent development potential).

The environmental impact analysis considers the effect of a project on the physical, social/cultural, and economic environment. Below is a list of the items that are considered when evaluating the impacts on the environment.

Table C-1

<b>Environmental Considerations</b>		
<b>Physical Environment</b>	<b>Social and Cultural Environment</b>	<b>Economic Environment</b>
Air quality	Housing	Businesses
Water Resources	Neighborhoods	Employment
Soils and Geology	Noise	Economic Development
Wildlife	Educational Facilities	Public Utilities
Vegetation	Churches	Transportation Costs
	Parks/Recreational Facilities	Capital Costs
	Public Health and Safety	Operation/Maintenance Costs
	National Defense	
	Aesthetics	

The environmental impact analysis also uses a probability rating from 0 to 1.00. A negative value is assigned to the probability to indicate a negative impact. The summation of both positive and negative impact probabilities with respect to these factors provides a measure of the relative environmental impacts of a project. Table C-2 shows the probability scale used in the analysis. This table can be used as a guideline for interpreting the "Economic Development" and "Environmental Impact" values given in Table C-1.

Table C-2

Impact	Probability
High	1.00
Significant	0.75
Moderate	0.50
Slight	0.25
None	0.00

Offsetting the benefits that would be derived from any project is the cost of its construction. A new facility, despite its high projected benefits, might prove to be unjustified due to the excessive costs involved in construction. The highway costs estimated in this report were derived from the projected project costs identified in the 1996-2002 Transportation Improvement Program. The anticipated right-of-way costs were broken out of the project costs using an average cost per acre for property throughout Currituck County according to the respective project. Table C-3 provides a breakdown of total project costs into construction costs and right-of-way costs for the major project proposals for the Thoroughfare Plan.

Table C-3

Benefits Evaluation of Selected Thoroughfare Plan Projects					
Project	Total Length (Miles) [km]	30-year Accrued Benefits (\$ Millions)	Project Cost (\$ Millions)	Econ. Develop- ment Potential	Enviro. Impact Prob.
NC 168 Bypass, from north of Moyock to US 158	15.0 [24.2]	70.4	40.7 {76.0}	.40	+ .40 - .50
US 158, Widen to 6 lanes divided from NC 168 to Dare County line	26.1 [42.0]	609.7	235.2	.70	+ .40 - .20
US 158, Widen to 5 lanes from Camden County to NC 168 at Barco	10.1 [16.3]	85.4	15.8	.50	+ .40 - .20
NC 168, Widen to 5 lanes from Virginia State Line to US 158 at Barco	18.5 [29.8]	2,421	55.1	.80	+ .40 - .30
NC 12, Widen to 4 lanes from Mid-Currituck Bridge to Dare County	8.5 [13.7]	34.6	27.6	.70	+ .30 - .30
Mid-Currituck Bridge, New-location bridge from Aydlett to Corolla	9.9 [15.9]	1,192	82.0	.50	+ .30 - .40

{ } - indicates ultimate cost to construct a four-lane freeway

# **Appendix D**

## **Recommended Definitions and Design Standards for Subdivision Ordinances**

### **Definitions**

#### ***Streets and Roads***

##### **Rural Roads**

1. *Principal Arterial* - A rural link in a highway system serving travel, and having characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of Interstate routes and other routes designated as principal arterials.
2. *Minor Arterial* - A rural roadway joining cities and larger towns and providing intra-state and inter-county service at relatively high overall travel speeds with minimum interference to through movement.
3. *Major Collector* - A road which serves major intra-county travel corridors and traffic generators and provides access to the Major Collector system.
4. *Minor Collector* - A road which provides service to small local communities and traffic generators and provides access to the Major Collector system.
5. *Local Road* - A road which serves primarily to provide access to adjacent land, over relatively short distances.

##### **Urban Streets**

1. *Major Thoroughfares* - Major thoroughfares consist of Inter-state, other freeway, expressway, or parkway roads, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.
2. *Minor Thoroughfares* - Minor thoroughfares perform the function of collecting traffic from local access streets and carrying it to the major thoroughfare system. Minor thoroughfares may be used to supplement the major thoroughfare system by facilitating minor through traffic movements and may also serve abutting property.
3. *Local Street* - A local street is any street not on a higher order urban system and serves primarily to provide direct access to abutting land.

##### **Specific Type Rural or Urban Streets**

1. *Freeway, expressway, or parkway* - Divided multi-lane roadways designed to carry large volumes of traffic at high speeds. A *freeway* provides for continuous flow of vehicles with no direct access to abutting property and with access to selected

crossroads only by way of interchanges. An *expressway* is a facility with full or partial control of access and generally with grade separations at major intersections. A *parkway* is for non-commercial traffic, with full or partial control of access.

2. *Residential Collector Street* - A local street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.
3. *Local Residential Street* - Cul-de-sacs, loop streets less than 750 meters in length, or streets less than 1.5 kilometers in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.
4. *Cul-de-sac* - A short street having only one end open to traffic and the other end being permanently terminated and a vehicular turn around provided.
5. *Frontage Road* - A road that is parallel to a partial or full access controlled facility and provides access to adjacent land.
6. *Alley* - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

## ***Property***

### **Building Setback Line**

A line parallel to the street in front of which no structure shall be erected.

### **Easement**

A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.

### **Lot**

A portion of a subdivision, or any other parcel of land, which is intended as a unit for transfer of ownership or for development or both. (Also includes "plat" and "parcel").

## ***Subdivision***

### **Subdivider**

Any person, firm, corporation, or official agent thereof, who subdivides or develops any land deemed to be a subdivision.

### **Subdivision**

All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, immediate or future, of sale or building development and all divisions of land involving the dedication of a new street or change in existing streets.

The following shall not be included within this definition nor subject to these regulations:

- The combination or re-combination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards contained herein
- the division of land into parcels greater than four hectares where no street right-of-way dedication is involved
- the public acquisition, by purchase, of strips of land for the widening or the opening of streets
- the division of a tract in single ownership whose entire area is no greater than 0.8 hectares into not more than three lots, where no street right-of-way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.

### **Dedication**

A gift, by the owner, of his property to another party without any compensation being given for the transfer. The dedication is made by written instrument and completed with an acceptance.

### **Reservation**

Reservation of land does not involve any transfer of property rights. It constitutes an obligation to keep property free from development for a stated period of time.

## **Design Standards**

### ***Streets and Roads***

The design of all roads within the Planning Area shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway Officials (AASHTO) manuals.

The provision of street rights-of-way shall conform and meet the recommendations of the Thoroughfare Plan, as adopted. The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally, the proposed streets should be the extension of existing streets if possible.

### ***Right-of-Way Widths***

Right-of-way (ROW) widths shall not be less than the following and shall apply except in those cases where ROW requirements have been specifically set out in the Thoroughfare Plan.

The subdivider will only be required to dedicate a maximum of 30 meters of ROW. In cases where over 30 meters of ROW is desired, the subdivider will be required only to reserve the amount in excess of 30 meters. In all cases in which ROW is sought for a fully controlled access facility, the subdivider will only be required to make a reservation.

It is strongly recommended that subdivisions provide access to properties from internal streets, and that direct property access to major thoroughfares, principal and minor arterials, and major collectors be avoided. Direct property access to minor thoroughfares is also undesirable.

A partial width ROW, not less than eighteen meters in width, may be dedicated when adjoining undeveloped property that is owned or controlled by the subdivider; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is subdivided, the remainder of the full required ROW shall be dedicated.

**Table D-1**

<b>Minimum Right-of-Way Requirements</b>		
<b>Area Classification</b>	<b>Functional Classification</b>	<b>Minimum ROW</b>
RURAL	Principal Arterial	Freeways: 105 m Other: 60 m
	Minor Arterial	30 m
	Major Collector	30 m
	Minor Collector	24 m
	Local Road	18 <sup>1</sup> m
URBAN	Major Thoroughfare	27 m
	Minor Thoroughfare	21 m
	Local Street	18 <sup>1</sup> m
	Cul-de-Sac	variable <sup>2</sup>

<sup>1</sup> The desirable minimum right-of-way (ROW) is 18 m. If curb and gutter is provided, 15 m is adequate on local residential streets.

<sup>2</sup> The ROW dimension will depend on the radius used for vehicular turn around. Distance from edge of pavement of turn around to ROW should not be less than distance from edge of pavement to ROW on street approaching turn around.

### ***Street Widths***

Widths for street and road classifications other than local shall be as recommended by the Thoroughfare Plan. Width of local roads and streets shall be as follows:

#### ***1. Local Residential***

- Curb & Gutter section: 7.8 meters, face to face of curb
- Shoulder section: 6.0 meters to edge of pavement, 1.2 meters for shoulders

#### ***2. Residential Collector***

- Curb & Gutter section: 10.2 meters, face to face of curb
- Shoulder section: 6.0 meters to edge of pavement, 1.8 meters for shoulders

### ***Geometric Characteristics***

The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System. In cases where a subdivision is

sought adjacent to a proposed thoroughfare corridor, the requirements of dedication and reservation discussed under *Right-of-Way* shall apply.

1. *Design Speed* - The design speed for a roadway should be a minimum of 10 km/h (5 mph) greater than the posted speed limit. The design speeds for subdivision type streets are shown in Table D-2.
2. *Minimum Sight Distance* - In the interest of public safety, no less than the minimum sight distance applicable shall be provided. Vertical curves that connect each change in grade shall be provide and calculated using the parameters set forth in Table D-3.
3. *Superelevation* - Table D-4 shows the minimum radius and the related maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads with no curb and gutter is 0.08. The maximum rate of superelevation for urban streets with curb and gutter is 0.06, with 0.04 being desirable.
4. *Maximum and Minimum Grades*
  - the maximum grades in percent are shown in Table D-5
  - minimum grade should not be less then 0.5%
  - grades for 30 meters each way from intersections (measured from edge of pavement) should not exceed 5%

**Table D-2**

<b>Design Speeds (in km/h)</b>			
<b>Facility Type</b>	<b>Desirable</b>	<b>Minimum</b>	
		<b>Level</b>	<b>Rolling</b>
<b>RURAL</b>			
Minor Collector Roads	100	80	60
Local Roads <sup>1</sup>	80	80	60
<b>URBAN</b>			
Major Thoroughfares <sup>2</sup>	100	60	60
Minor Thoroughfares	100	50	50
Local Streets	50	50	30

<sup>1</sup> Local Roads include Residential Collectors and Local Residential

<sup>2</sup> Major Thoroughfares other than Freeways or Expressways

## **Intersections**

1. Streets shall be laid out so as to interest as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty-five (65) degrees.
2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets

from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.

3. Off-set intersections are to be avoided. Intersections which cannot be aligned should be separated by a minimum length of 60 meters between survey centerlines.

### **Cul-de-sacs**

Cul-de-sacs shall not be more than one hundred and fifty (150) meters in length. The distance from the edge of pavement on the vehicular turn around to the right-of-way line should not be less than the distance from the edge of pavement to right-of-way line on the street approaching the turn around. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

**Table D-3**

<b>Sight Distance</b>					
<b>Design Speed (km/h)</b>	<b>Stopping Sight Distance (m)</b>		<b>Minimum K<sup>1</sup> Values (m)</b>		<b>Passing Sight Distance (m) for 2-lanes</b>
	Desirable	Minimum	Crest Curve	Sag Curve	
30	30	29.6	3	4	*
50	70	57.4	9	11	*
60	90	74.3	14	15	*
90	170	131.2	43	30	*
100	210	157.0	62	37	*

Note: General practice calls for vertical curves to be multiples of 10 meters. Calculated lengths shall be rounded up in each case.

<sup>1</sup> K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length of the vertical curve which will provide the desired sight distance. Sight distance provided for stopped vehicles at intersections should be in accordance with "A Policy on Geometric Design of Highways and Streets, 1990."

\* Minimum passing distance for 2-lanes is currently under revision. (Reference NCDOT Roadway Metric Design Manual page 1-12 T-1)

**Table D-4**

<b>Superelevation Table</b>			
<b>Design Speed (km/h)</b>	<b>Minimum Radius of Maximum e<sup>1</sup></b>		
	<b>e = 0.04</b>	<b>e = 0.06</b>	<b>e = 0.08</b>
50	100	90	80
65	175	160	145
80	280	250	230
100	490	435	395

<sup>1</sup> e = Rate of roadway superelevation, meter per meter

Note: Reference NCDOT Roadway Design Manual, page 1-12 T-6 through T-8

Table D-5

Maximum Vertical Grade				
Facility Type	Design Speed (km/h)	Minimum Grade in Percent		
		Flat	Rolling	Mountainous
RURAL				
Minor Collector Roads *	30	7	10	12
	50	7	9	10
	65	7	8	10
	80	6	7	9
	100	5	6	8
	110	4	5	6
Local Roads * <sup>1</sup>	30	--	11	16
	50	7	10	14
	65	7	9	12
	80	6	8	10
	100	5	6	--
URBAN				
Major Thoroughfares <sup>2</sup>	50	8	9	11
	65	7	8	10
	80	6	7	9
	100	5	6	8
Minor Thoroughfares *	30	9	12	14
	50	9	11	12
	65	9	10	12
	80	7	8	10
	100	6	7	9
	110	5	6	7
Local Streets *	30	--	11	16
	50	7	10	14
	65	7	9	12
	80	6	8	10
	100	5	6	--

\* For streets and roads with projected annual average daily traffic less than 250 or short grades less than 150 meters (500 ft) long, grades may be 2% steeper than the values in the above table. (Reference NCDOT Roadway Metric Design Manual, page 1-12 T-3)

<sup>1</sup> Local Roads including Residential Collectors and Local Residential.

<sup>2</sup> Major Thoroughfares other than Freeways or Expressways.

## Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provisions are made for service access. Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.

2. The width of an alley shall be at least 6.0 meters.
3. Dead-end alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turn around facilities at the dead-end as may be required by the Planning Board.

### **Permits for Connection to State Roads**

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is available at the office of the District Engineer of the Division of Highways.

### **Offsets To Utility Poles**

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 9.0 meters from the edge of pavement. On streets with curb and gutter, utility poles shall be set back a minimum distance of 1.8 meters from the face of curb.

### **Wheel Chair Ramps**

All street curbs being constructed or reconstructed for maintenance purposes, traffic operations, repairs, correction of utilities, or altered for any reason, shall provide wheelchair ramps for the physically handicapped at intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

### **Horizontal Width on Bridge Deck**

1. The clear roadway widths for new and reconstructed bridges serving 2-lane, two-way traffic should be as follows:
  - shoulder section approach:
    - under 800 ADT design year - minimum 8.4 meters width, face to face of parapets or rails, or pavement width plus 3 meters, whichever is greater.
    - 800 - 2000 ADT design year - minimum 10.2 meters width, face to face of parapets or rails, or pavement width plus 3.6 meters, whichever is greater.
    - over 2000 ADT design year - minimum width of 12 meters, desirable width of 13.2 meters width face to face of parapets or rails
  - curb and gutter approach:
    - under 800 ADT design year - minimum 7.2 meters face to face of curbs.
    - over 800 ADT design year - width of approach pavement measured face to face of curbs.
  - Where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height, in width of face to face curbs, and in

crown drop. The distance from face of curb to face of parapet or rail shall be a minimum of 450 millimeters, or greater if sidewalks are required.

2. The clear roadway widths for new and reconstructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:

- shoulder section approach - width of approach pavement plus width of usable shoulders on the approach left and right (shoulder width 2.4 m minimum, 3 m desirable).
- curb and gutter approach - width of approach pavement measured face to face of curbs.

**Table D-6**

<b>Exact Metric Equivalents</b>	
<b>English Units</b>	<b>Metric Units</b>
1 inch	equals 2.54 centimeters (cm)
1 foot	equals 0.30 meters (m)
1 mile	equals 1.61 kilometers (km)
1 acre	equals 0.40 hectares (ha)

**Table D-7**

<b>Exact English Equivalents</b>	
<b>Metric Units</b>	<b>English Units</b>
1 centimeter (cm)	equals 0.39 inches
1 meter (m)	equals 3.28 feet
1 kilometer (km)	equals 0.62 miles
1 hectare (ha)	equals 2.47 acres

**Table D-8**

<b>NCDOT Metric Roadway Conversions</b>			
<b>Lane Widths</b>		<b>Shoulder Widths</b>	
8 feet	2.4 m	1 foot	0.3 m
9 feet	2.7 m	2 feet	0.6 m
10 feet	3.0 m	4 feet	1.2 m
11 feet	3.3 m	6 feet	1.8 m
12 feet	3.6 m	8 feet	2.4 m
14 feet	4.2 m		



## **Appendix E**

### **Level of Service Definitions**

The various levels of service are defined below for uninterrupted flow facilities, but the basic concepts apply to all roads. These levels of service are illustrated in Figure E-1.

#### **LOS A**

Represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.

#### **LOS B**

Is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behavior.

#### **LOS C**

Is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably in this range.

#### **LOS D**

Represents high-density, but stable, flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.

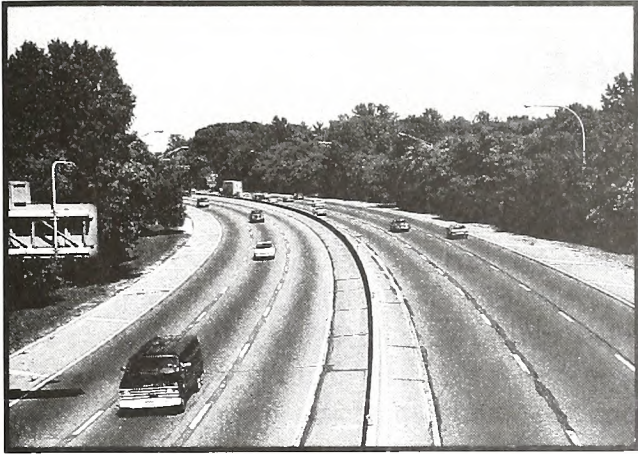
#### **LOS E**

Represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.

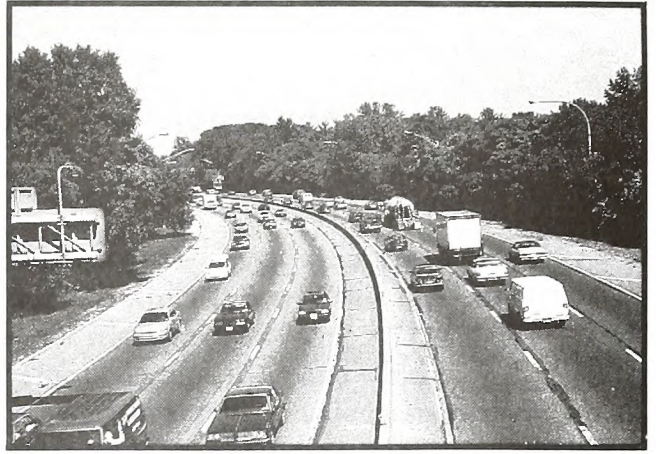
#### **LOS F**

Is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues

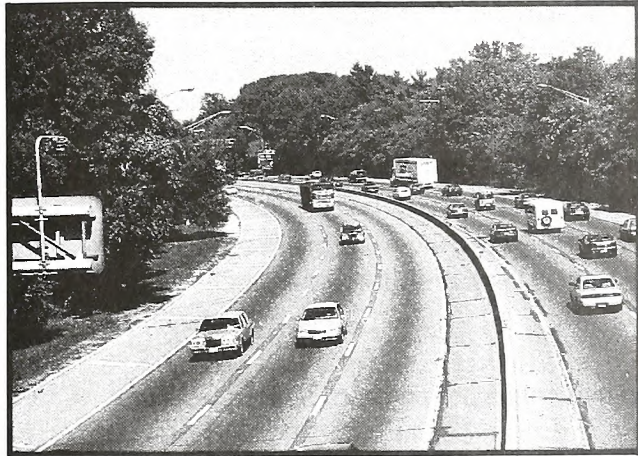
form behind such locations. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. Vehicles may progress at reasonable speeds for several hundred feet or more, then be required to stop in a cyclic fashion. Level of Service F is used to describe the operating conditions within the queue, as well as the point of breakdown. It should be noted, however, that in many cases operating conditions of vehicles or pedestrians discharged from the queue may be quite good.



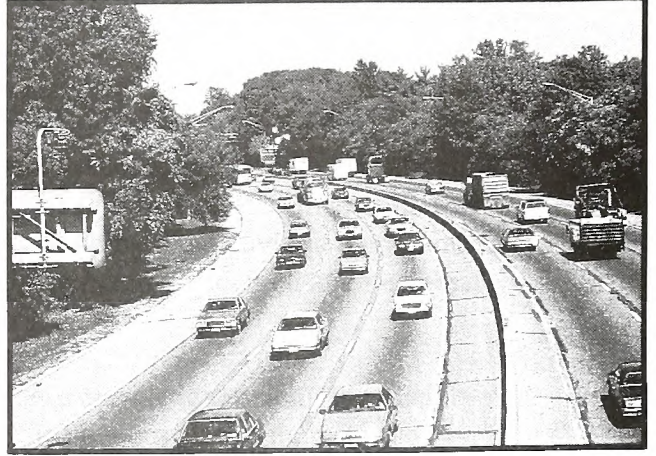
*LOS A.*



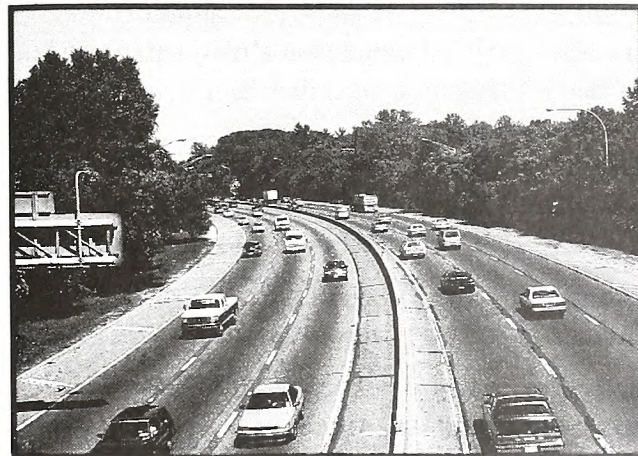
*LOS D.*



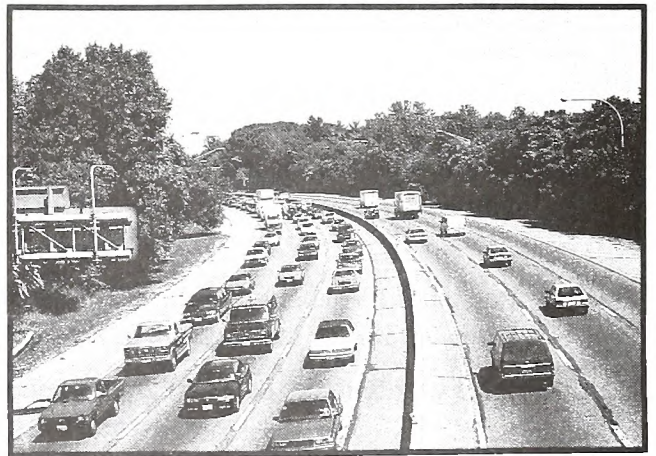
*LOS B.*



*LOS E.*



*LOS C.*



*LOS F.*

**FIGURE E-1**  
**LEVELS OF SERVICE**



# **Appendix F**

## **County and Public Involvement**

### **Citizen Survey**

In November of 1995, Currituck County conducted a survey on growth issues and future development in the county. The survey, entitled *Survey of Citizens' Views and Opinions*, was mailed to 789 property owners and received a response rate of almost 71%, thus providing accuracy of  $\pm 5\%$ . While the survey focused primarily on growth and development, several questions were specifically related to transportation issues.

When asked how to handle the anticipated overcrowding of the five-lane US 158 and NC 168, over 58% of respondents preferred bypassing the congested roads. Another 29% were in favor of leaving the five-lane roads congested with no further improvements. Only 1 in 8 suggested widening the existing roads to seven lanes. This survey showed that community support for a bypass of NC 168 in the northern part of the county is strong.

In addition to the bypass, the majority of citizens polled were also in favor of requiring new subdivisions to connect to secondary roads so that congestion on US 158 and NC 168 could be minimized. Currituck County's policy is in agreement with this response, as they have been very proactive in designing their subdivision regulations to require the least possible impact on these highways from residential and business driveway accesses.

Finally, 50% of those polled stated that providing bicycle lanes along the roads would have a positive effect on the quality of life in the county. Due to the nature of the Outer Banks as a tourist destination, provisions for bicycles are a high priority of the County.

### **Public Involvement**

On July 17, 1995, NCDOT introduced the thoroughfare planning process at a County Commissioners' meeting. This meeting also included an overview of the proposed steps in the plan's development, along with a discussion of the various public involvement opportunities that are available for use.

On February 20, 1996, a meeting was held with Mr. Jack Simoneau, Director of Planning and Inspections for Currituck County. During this meeting, many issues were brought up, including the following:

- Increasing development pressure from the Hampton Roads, Virginia, area will soon cause rapid residential development in the northern part of the county.
- The public opinion survey, mentioned above, revealed that highway safety is one of the highest concerns of local citizens.

- Recently developed driveway regulations should help preserve road capacity along NC 168 and US 158.
- Collector roads along US 158 in the southern part of the county could be connected to provide better traffic circulation for residents desiring to avoid US 158. Also, these connections will help to minimize the number of future traffic signals along US 158.
- The current 5-lane widening of NC 168 will not be able to handle anticipated traffic volumes in the year 2025. Because of this, a new-location bypass facility was discussed.
- Bicycling is becoming an increasingly popular activity along NC 12 and NC 615 and should be accommodated.

From this discussion and analyses of the transportation system in the county, a set of preliminary recommendations were developed. On April 14, 1997, a joint meeting was held with the County Commissioners, the County Planning Board, the Thoroughfare Planning Committee, County Planning Staff, and NCDOT to present a preliminary version of the thoroughfare plan for the county. Among the major projects proposed at this meeting were:

- Completing the widening of NC 168 to five lanes;
- Widening US 158 to multiple lanes between Camden County and Barco;
- Widening US 158 to 6 lanes south of Barco;
- Constructing a bypass of NC 168 from north of Moyock to US 158;
- Completing planning, design, and construction of the Mid-Currituck Bridge;
- Widening NC 12 to a four-lane boulevard facility;
- Connecting several secondary roads to provide for circulation in the southern part of the county; and
- Widening several secondary roads throughout the county to standard two-lane roads with 24-foot pavement width.

In general, most of the projects were mutually agreeable by all parties. However, there were several additional requests and concerns brought out by local officials. These included the following (followed by responses):

- Weekend summertime traffic is spreading out to Friday and Monday, thus causing greater congestion, delay, and inconvenience to residents. Summer weekend traffic counts were requested.

*Traffic counts were taken in five locations throughout the county during the week of July 11-18, 1997. These counts were compared to the week-long average, the weekday average, and average annual daily traffic estimates (AADT). Saturday, July 12<sup>th</sup>, was found to be the heaviest traffic day, with*

counts between 141% and 228% higher than the annual average traffic estimate. The second highest counts occurred on Sunday, July 13<sup>th</sup>, with traffic between 90% and 169% higher than the annual average. However, because these peaks are so much higher than the average, and because they generally occur on just 30 days each year (on weekends between Memorial and Labor Days), it is not an efficient use of state money to plan for these extraordinary occurrences.

As discussed at the April 14<sup>th</sup> meeting, the state typically plans for average summer weekday traffic in tourist areas. This accommodates the primary needs of the residents, including travel to and from work and other activities during the week. In addition, since highways can only be built in "whole lane" increments, there is usually excess capacity in these plans which can also help to alleviate (and may even accommodate) the conditions during the peak weekends mentioned previously.

- An investigation into the possibility of constructing fly-overs at the following intersections was requested: US 158/NC 168 and US 158/proposed Mid-Currituck Bridge.

Based on intersection studies done by the Traffic Engineering Branch of NCDOT at the above locations, as well as additional summertime traffic information supplied by the NCDOT Traffic Surveys Unit, fly-overs are recommended at the intersection of US 158 and NC 168, as well as at the intersection of US 158 and the proposed Mid-Currituck Bridge. These fly-overs should be constructed in conjunction with the widening of US 158 to 4 and 6 lanes and the construction of the Mid-Currituck Bridge. The fly-over at NC 168 and US 158 is included in the 2000-2006 Draft State Transportation Improvement program.

- Evacuation safety during severe weather needs to be considered carefully. US 158, especially since it is a designated hurricane route, needs a high priority for widening.

Contact was made with officials in North Carolina and Virginia regarding circumstances related to several recent hurricane evacuations. The appropriate names and telephone numbers were supplied to the Director of Planning and Inspections for Currituck County. With regard to US 158, the County should lobby the Department of Transportation during the annual Transportation Improvement Program (TIP) hearings held each fall for an accelerated scheduling of the US 158 widening project.

- Concerns were voiced over the provision for tolls to be collected on the proposed Mid-Currituck Bridge.

*This concern was forwarded to the Program Analysis Unit of NCDOT. The toll was proposed to speed up the bridge's construction. Without the toll, the bridge would fall to a lower position on the state's priority list of projects, thus significantly delaying its construction. However, a discounted multi-use pass will be available for people who use the bridge on a regular basis.*

- If US 158 is widened over Coinjock Canal, a request was made to consider constructing a parallel bridge since a barge could conceivably damage a single bridge and block traffic from exiting the island during severe weather.

*This request will be recommended in the thoroughfare plan and will be further examined during project planning and design.*

- Growth in Dare County should be considered in developing the Currituck County traffic projections, since much of the traffic using US 158 and NC 168 is traveling to the Outer Banks.

*After careful review, it was determined that the population and traffic growth in Dare County had already been accounted for within the trend-line projections of traffic on the major routes in Currituck County. Therefore, no changes are anticipated to the existing traffic projections.*

- Connect the NC 168 Bypass directly to the proposed Mid-Currituck Bridge.

*Based on an analysis of the proposed NC 168 Bypass and surrounding facilities, an extension of the bypass to connect directly with the proposed Mid-Currituck bridge is not warranted at this time. The currently proposed widening of US 158 along its existing alignment will be more cost-efficient, will provide fewer environmental impacts, and should sufficiently handle the anticipated traffic.*

- Ensure that there is connectivity between proposals for the future widening of NC 12 in Currituck and Dare Counties.

*In Dare County, a future three-lane cross section for NC 12 was agreed upon by the local communities north of US 158. (A four-lane cross section was originally recommended by NCDOT.) It is anticipated that this three-lane widening will only provide an interim solution and that, at some point in the future, they will be forced to widen the route to four lanes due to increasing traffic. For this reason, a four-lane cross section is recommended for NC 12 in Currituck County with the hope that the officials in Dare County will eventually upgrade their proposal.*

On November 4, 1997 NCDOT met with the Currituck County Planning Board and the Thoroughfare Plan committee. The purpose of the meeting was to give an update of the study, and to discuss the public involvement process.

On February 2, 1998 NCDOT presented the recommended plan to the Currituck County Board of Commissioners.

On February 3-5, 1998 a public workshops were held in Knott's Island, Corolla and Currituck. Turnout was light. Issues of concern included:

- location and impact of the Mid-Currituck Bridge
- connectivity of bike lanes along outer banks
- location of NC 168 bypass

As a result of the concern over the location of the bypass, NCDOT obtained more detailed mapping from the county and completed a functional design that included four alternative routes for the bypass.

At a public hearing on August 3, 1998 the NC 168 bypass alternatives and the recommended plan were presented to the Currituck County Board of Commissioners. As a result of the extensive public comment received at the public hearing, the Commissioners set up two additional public meetings: Moyock Elementary School on September 16, 1998; and, Harbinger Fire Station on September 14, 1998. These meetings were well attended, with the majority of those in attendance speaking against the new bridge. Following these meeting, the Commissioners determined there needed to be two additional meetings: one on the Outer Banks and one in Shawboro. As of early 1999, these meeting had not been scheduled by the County Commissioners, and they have yet to take action on the recommended plan.

STATE LIBRARY OF NORTH CAROLINA



3 3091 00603 2676



